Airtime

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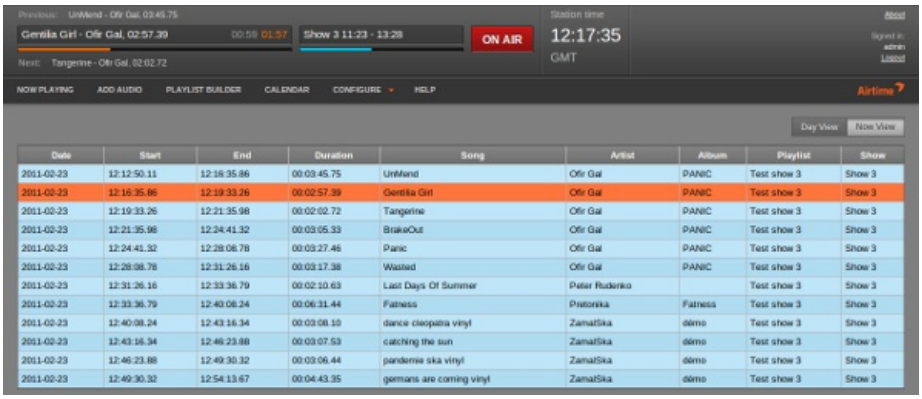
INTRODUCTION

Airtime for Broadcasters

Airtime is the open broadcast software for scheduling and remote station management. Web browser access to the station's media, multi-file upload and automatic metadata verification features are coupled with a collaborative on-line scheduling calendar and playlist management. The scheduling calendar is managed through an easy-to-use interface and triggers playout with sub-second precision.



Date	Start	End	Duration	Song	Artist	Album	Playlist	Show
2011-02-23	12:12:50.11	12:16:35.86	00:03:45.75	UnMend	Ofir Gal	PANIC	Test show 3	Show 3
2011-02-23	12:16:35.86	12:19:33.26	00:02:57.39	Gentila Girl	Ofir Gal	PANIC	Test show 3	Show 3
2011-02-23	12:19:33.26	12:21:35.98	00:02:02.72	Tangerine	Ofir Gal	PANIC	Test show 3	Show 3
2011-02-23	12:21:35.98	12:24:41.32	00:03:05.33	BrakeOut	Ofir Gal	PANIC	Test show 3	Show 3
2011-02-23	12:24:41.32	12:28:08.78	00:03:27.46	Panic	Ofir Gal	PANIC	Test show 3	Show 3
2011-02-23	12:28:08.78	12:31:26.16	00:03:17.38	Wasted	Ofir Gal	PANIC	Test show 3	Show 3
2011-02-23	12:31:26.16	12:33:36.79	00:02:10.63	Last Days Of Summer	Peter Ruderko		Test show 3	Show 3
2011-02-23	12:33:36.79	12:40:08.24	00:06:31.44	Fatness	Pretonika	Fatness	Test show 3	Show 3
2011-02-23	12:40:08.24	12:43:16.34	00:03:08.10	dance cleopatra vinyl	ZamalSka	démo	Test show 3	Show 3
2011-02-23	12:43:16.34	12:46:23.88	00:03:07.53	catching the sun	ZamalSka	démo	Test show 3	Show 3
2011-02-23	12:46:23.88	12:49:30.32	00:03:06.44	pandemie ska vinyl	ZamalSka	démo	Test show 3	Show 3
2011-02-23	12:49:30.32	12:54:13.67	00:04:43.35	germans are coming vinyl	ZamalSka	démo	Test show 3	Show 3

Airtime has been intended to provide a solution for a wide range of broadcast projects, from community to public and commercial stations. The scalability of Airtime allows implementation in a number of scenarios, ranging from an unmanned broadcast unit accessed remotely through the Internet, to a local network of machines accessing a central Airtime storage system. Airtime supports the playout of files in both the commonly used MP3 format and the open, royalty-free equivalent Ogg Vorbis.

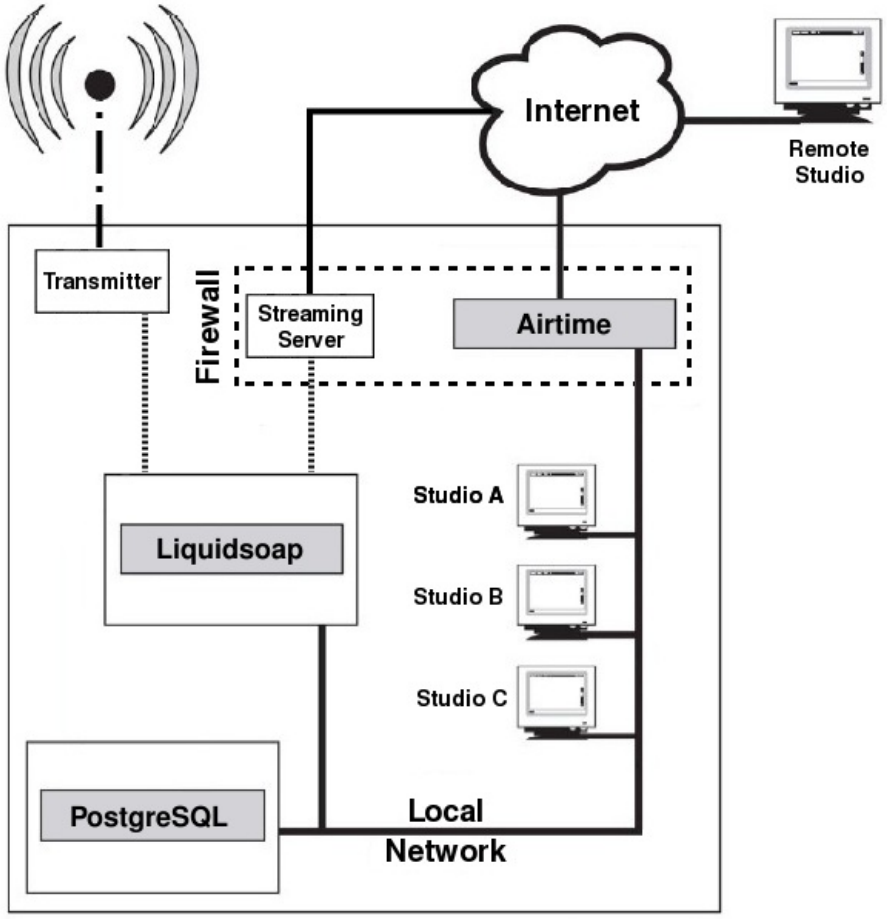
Airtime manages the Liquidsoap stream generator, which is at the heart of the system. Liquidsoap accesses the Airtime media archive, stored in a PostgreSQL database. Editors and station controllers can use Airtime to build playlists and manage files (upload, add metadata, manage advertisements) inside the station or via the Internet, using a standard web browser such as Mozilla Firefox or Internet Explorer.

The scheduler in Airtime has a calendar view, organized by months, weeks and days. Here the program editors can schedule playlists and streams for their broadcast station. In some scenarios, the transmitter is situated outside the reach of the broadcaster and all program management has to be maintained through the web interface. Possible reasons for this scenario might be of a pragmatic nature (running many stations from one central office due to limited human resources) or an emergency (running a transmitter in a crisis area without putting staff at risk).

Example system

Combining Airtime, the Liquidsoap stream generator and PostgreSQL storage, you can supply a broadcast station with all the functionality needed for automation.

In the diagram below, the media files are stored on a separate PostgreSQL machine accessible through the local network. Liquidsoap outputs streams to both the transmitter and a streaming media server. The machine running Airtime is behind a firewall because it is connected both to the local network, and to the Internet for remote access. This enables Airtime to offer password-protected access to the media database and scheduling from both inside and outside the studio building.


Internet
Remote
Studio
Transmitter
Firewall
Streaming
Server
Airtime
Studio A
Liquidsoap
Studio B
Studio C
PostgreSQL
Local
Network

INSTALLATION

Preparing the server

The following instructions assume that you have root access (*sudo* on Ubuntu) to a GNU/Linux server, and are familiar with basic command line tasks.

The recommended Airtime server platform is Ubuntu 10.04 'Lucid Lynx' LTS. Debian 6.0 'squeeze' is also a good option. The server should have at least a 1GHz processor and 512MB of RAM. The Airtime installation does not use much disk space, but you should allow plenty of storage capacity for the media archive. A hot-swap RAID array is recommended for the media archive, in case of disk failure. You should also consider a UPS or other battery powered system to offer some protection against short-term power failures.

If you intend that your Airtime server will have a direct audio output to a broadcast transmitter or a separate stream encoder, your server machine must have a soundcard supported by an ALSA driver. Almost all standard soundcards have ALSA drivers built into the Linux kernel, which do not need to be installed separately. If in doubt about driver support for your soundcard, check the ALSA soundcard matrix at: http://www.alsa-project.org/main/index.php/Matrix:Main

If your Airtime machine will only be used to stream to an Icecast streaming media server, you do not require a soundcard to be installed on the server side. This option is suitable for Airtime installations at your ISP's datacenter, remote from any transmitter.

The Airtime web administration interface is intended to work with any browser, on any desktop or mobile platform. The recommended web browser is Mozilla Firefox 3.6.

Install dependencies

When installing on an Ubuntu server, a few of the packages that Airtime relies on are in the Ubuntu *universe* or *multiverse* repositories. If either of these repositories is disabled, you can enable them in the */etc/apt/sources.list* file, by opening the *nano* editor in your server's console with the command:

```
$ sudo nano /etc/apt/sources.list
```

Find the lines which begin *deb* and end with *lucid universe* or *lucid-updates universe*, adding *multiverse* to the end of these lines, if it is not there already. The multiverse repository is required for the *libmp3lame0* library, which is an MP3 encoder.

The exact repository mirror URLs in your *sources.list* file will differ from the above screenshot, depending on your location.

For a Debian server, you can install the *lame* library package by adding the following repository to the /etc/apt/sources.list file:

```
deb http://www.debian-multimedia.org squeeze main non-free
```

Press Ctrl+O (the Ctrl key and the letter O together) to save the file, then Ctrl+X to exit the *nano* editor. Then reload the package list with:

```
$ sudo apt-get update
```

This command fetches lists of the latest packages from the repositories that you have configured for your server.

```
daniel@office:~$ sudo apt-get update
Hit http://security.ubuntu.com lucid-security Release.gpg
Hit http://gb.archive.ubuntu.com lucid Release.gpg
Ign http://security.ubuntu.com/ubuntu/ lucid-security/main Translation-en_GB
Hit http://gb.archive.ubuntu.com/ubuntu/ lucid/main Translation-en_GB
Ign http://security.ubuntu.com/ubuntu/ lucid-security/universe Translation-en_GB
Hit http://gb.archive.ubuntu.com/ubuntu/ lucid/universe Translation-en_GB
Hit http://security.ubuntu.com lucid-security Release
Hit http://gb.archive.ubuntu.com/ubuntu/ lucid/multiverse Translation-en_GB
Hit http://security.ubuntu.com lucid-security/main Packages
Hit http://gb.archive.ubuntu.com lucid-updates Release.gpg
Hit http://security.ubuntu.com lucid-security/universe Packages
Ign http://gb.archive.ubuntu.com/ubuntu/ lucid-updates/main Translation-en_GB
Ign http://gb.archive.ubuntu.com/ubuntu/ lucid-updates/universe Translation-en_GB
Ign http://gb.archive.ubuntu.com/ubuntu/ lucid-updates/multiverse Translation-en_GB
Hit http://gb.archive.ubuntu.com lucid Release
Hit http://gb.archive.ubuntu.com lucid-updates Release
Hit http://gb.archive.ubuntu.com lucid/main Packages
Hit http://gb.archive.ubuntu.com lucid/universe Packages
Hit http://gb.archive.ubuntu.com lucid/multiverse Packages
Hit http://gb.archive.ubuntu.com lucid-updates/main Packages
Hit http://gb.archive.ubuntu.com lucid-updates/universe Packages
Hit http://gb.archive.ubuntu.com lucid-updates/multiverse Packages
Reading package lists... Done
daniel@office:~$
```

Next, install the list of dependencies for Airtime. For example, on Ubuntu 10.04 (Lucid Lynx) LTS you could enter the command:

```
$ sudo apt-get install apache2 daemontools daemontools-run icecast2 \
libao-ocaml libapache2-mod-php5 libcamomile-ocaml-dev libesd0 \
libmad-ocaml libmp3lame0 libportaudio2 libsamplerate0 libsoundtouch-ocaml \
libtaglib-ocaml libvorbis-ocaml-dev multitail odbc-postgresql \
oggvideotools openssl php-pear php5-gd php5-pgsql poc-streamer \
postgresql pwgen python python-configobj python-mutagen unzip
```

The final dependency to install is *phing* (note that you must use the version number shown):

```
$ sudo pear channel-discover pear.phing.info
$ sudo pear install phing/phing-2.4.2
```

Remove PulseAudio

The PulseAudio sound server is not compatible with Airtime. To remove it from an Ubuntu machine, type the following command:

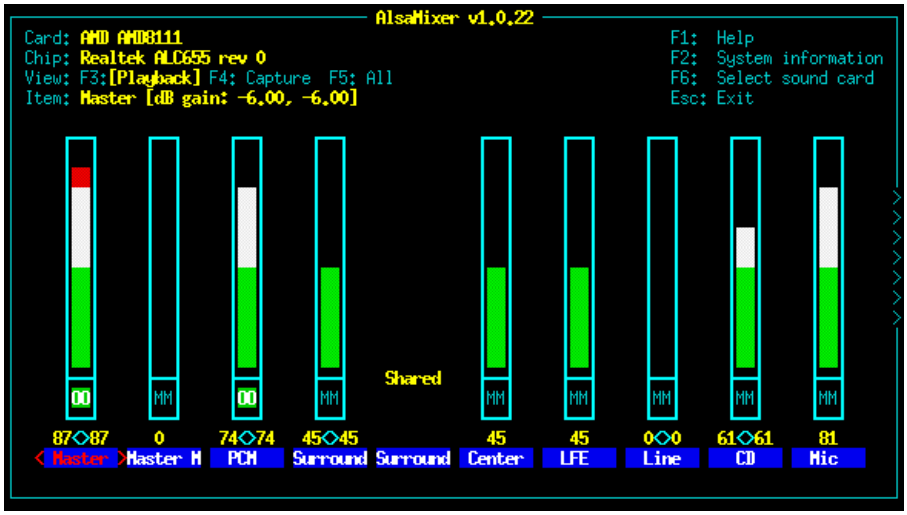
```
$ sudo apt-get purge pulseaudio
```

Removing the *pulseaudio* package on a desktop Ubuntu machine may force the removal of the *ubuntu-desktop* metapackage. However, this metapackage is only on the system for managing upgrades; removing it does not remove the GNOME desktop.

After removing PulseAudio, if your Airtime machine has a desktop and a soundcard, you can install a mixer applet which can control the ALSA soundcard driver directly, such as *gnome-alsamixer*:

```
$ sudo apt-get install gnome-alsamixer
```

On a server with a soundcard but without a desktop, you can control sound output levels using the command line program *alsamixer*. This package should already be installed on an Ubuntu machine with a soundcard.



Configure PHP

Edit the *php.ini* file to change PHP settings for the server to those that Airtime requires.

```
$ sudo nano /etc/php5/apache2/php.ini
```

This is a long file, so use the search tool (press Ctrl+W) to find the particular lines that you're looking for. The recommended initial settings for Airtime are:

```
memory_limit = 256M

request_order = "GPC"

post_max_size = 150M

upload_max_filesize = 150M

upload_tmp_dir = /tmp

session.gc_probability = 0
```

If any of the above lines are commented out with a semi-colon at the beginning, you will need to remove that semi-colon for the setting to work.

You also need to set the time zone that Airtime will display. Find the line in the *php.ini* file which begins *date.timezone*, remove the semi-colon comment if present, and add the required time zone to the end of the line. For example:

```
date.timezone = "America/Toronto"
```

The time zone value should be in quotes, as above. You can find the correct value for your server's time zone in the appendix of this manual.

Press Ctrl+O to save the *php.ini* file, then Ctrl+X to exit the *nano* editor.

Manual installation

The latest version of the Airtime installer is available at:

http://www.sourcefabric.org/en/products/airtime_download/

For example, to download version 1.6.1 from SourceForge in the server console you could enter the command:

```
$ wget http://sourceforge.net/projects/airtime/files/airtime-1.6.1-GA.tar.gz
```

```
daniel@office:~/64studio/airtime$ wget http://sourceforge.net/projects/airtime/files/airtime-1.6.
1-GA.tar.gz
--2011-03-01 13:27:12--  http://sourceforge.net/projects/airtime/files/airtime-1.6.1-GA.tar.gz
Resolving sourceforge.net... 216.34.181.60
Connecting to sourceforge.net|216.34.181.60|:80... connected.
HTTP request sent, awaiting response... 302 Found
Location: http://sourceforge.net/projects/airtime/files/airtime-1.6.1-GA.tar.gz/download [followi
ng]
--2011-03-01 13:27:14--  http://sourceforge.net/projects/airtime/files/airtime-1.6.1-GA.tar.gz/do
wnload
Reusing existing connection to sourceforge.net:80.
HTTP request sent, awaiting response... 302 Found
Location: http://downloads.sourceforge.net/project/airtime/airtime-1.6.1-GA.tar.gz?r=&ts=12989860
37&use_mirror=switch [following]
--2011-03-01 13:27:15--  http://downloads.sourceforge.net/project/airtime/airtime-1.6.1-GA.tar.gz
?r=&ts=1298986037&use_mirror=switch
Resolving downloads.sourceforge.net... 216.34.181.59
Connecting to downloads.sourceforge.net|216.34.181.59|:80... connected.
HTTP request sent, awaiting response... 302 Found
Location: http://switch.dl.sourceforge.net/project/airtime/airtime-1.6.1-GA.tar.gz [following]
--2011-03-01 13:27:15--  http://switch.dl.sourceforge.net/project/airtime/airtime-1.6.1-GA.tar.gz
Resolving switch.dl.sourceforge.net... 130.59.138.21, 2001:620:0:1b::21
Connecting to switch.dl.sourceforge.net|130.59.138.21|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 180724646 (172M) [application/x-gzip]
Saving to: `airtime-1.6.1-GA.tar.gz'

 2% [>                                                  ] 4,355,494    426K/s  eta 4m 58s
```

Unzip the file you have just downloaded to the installation directory */var/lib/airtime/* with the following command:

```
 $ sudo tar -xvzf airtime-1.6.1-GA.tar.gz -C /var/lib/
```

Change the ownership of the installation directory to the *root* user so that it is more secure:

```
$ sudo chown -R root.root /var/lib/airtime/
```

Configure Apache

Check that the Apache web server modules that Airtime requires are enabled:

```
$ sudo a2enmod php5 rewrite
```

The server should respond:

```
Module php5 already enabled
Module rewrite already enabled
```

Next, create the Airtime virtual host configuration file for Apache:

```
$ sudo nano /etc/apache2/sites-available/airtime
```

and enter the information below, substituting your system administrator's email address for *admin@example.com*. Make sure you set the *DocumentRoot* and *Directory* paths correctly. This should match the *public* sub-directory of the installation directory that you unzipped the Airtime tarball into, such as */var/lib/airtime/public* in this example.

```
<VirtualHost *:80>
   ServerAdmin admin@example.com
   DocumentRoot /var/lib/airtime/public

  SetEnv APPLICATION_ENV "development"

  <Directory /var/lib/airtime/public>
      DirectoryIndex index.php
      AllowOverride all
      Order allow,deny
```

```
      Allow from all
  </Directory>
</VirtualHost>
```

Press Ctrl+O to save the file, then Ctrl+X to exit the *nano* editor. Then enter the command:

```
$ sudo a2ensite airtime
```

The server should respond:

```
Enabling site airtime.
Run '/etc/init.d/apache2 reload' to activate new configuration!
```

As suggested by the output of the command above, reload the web server configuration.

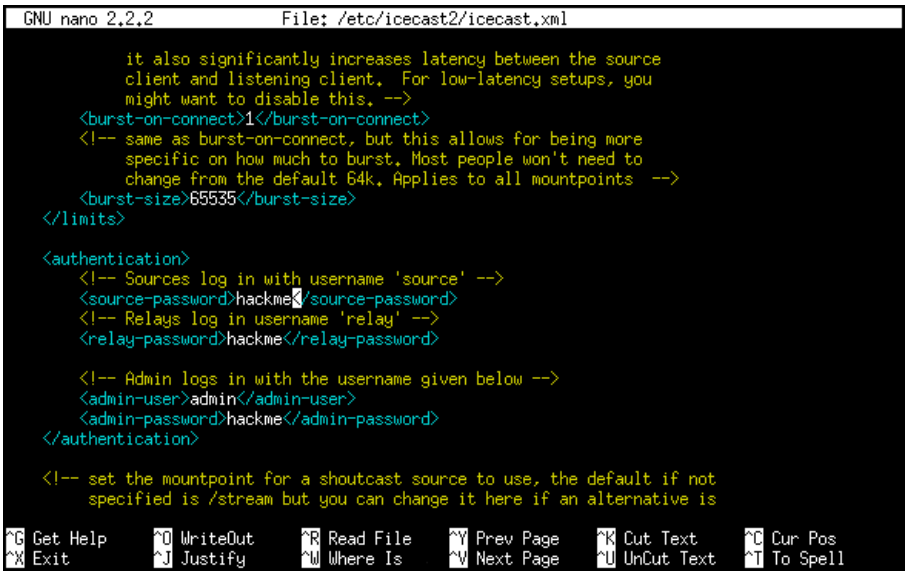
```
$ sudo /etc/init.d/apache2 reload
```

The server should respond:

```
 * Reloading web server config apache2
```

Enable Icecast

Before you run the Icecast streaming media server for the first time, edit the file */etc/icecast2/icecast.xml* to change the default ‹*source-password*›, ‹*relay-password*› and ‹*admin-password*› values from '*hackme*' to something more secure.



Then set up the Icecast server to start automatically:

```
$ sudo nano /etc/default/icecast2
```

by setting the value of *ENABLE* to *true* on the last line of this file:

```
ENABLE=true
```

Save and close the file with Ctrl+O and Ctrl+X, then start Icecast:

```
$ sudo service icecast2 start
```

The server should respond:

```
Starting icecast2: Starting icecast2
Detaching from the console
icecast2.
```

Set up and install Airtime

In the Liquidsoap configuration file */var/lib/airtime/pypo/scripts/ls_config.liq*, set the value of *icecast_pass* to the ‹*source-password*› value that you set in the Icecast configuration file:

```
$ sudo nano /var/lib/airtime/pypo/scripts/ls_config.liq
```

```
  GNU nano 2.2.2        File: /var/lib/airtime/pypo/scripts/ls_config.liq

archive_dir = "/opt/pypo/archive/"

# list pointing to the current couchcaster mountpoint
couchcaster_list = "http://vdeb.openbroadcast.ch/mod/ml/api/pypo/current_couchcaster"


##########################################
# stream settings                        #
##########################################
icecast_host = "127.0.0.1"
icecast_port = 8000
icecast_pass = "hackme"

# mountpoints
mount_point_mp3 = "airtime.mp3"
mount_point_vorbis = "airtime.ogg"

# mount intra is used for scheduler >>> fallback stream
mount_intra = "pypo_intra"

# intra-LS streaming (no icecast here)
intra_host = "127.0.0.1"
intra_port = 9000
intra_pass = "hackme"

icecast_url = "http://airtime.sourcefabric.org"
icecast_description = "Airtime Radio!"
icecast_genre = "genre"

output_sound_device = false
output_icecast_vorbis = true
output_icecast_mp3 = true

^G Get Help    ^O WriteOut    ^R Read File   ^Y Prev Page   ^K Cut Text    ^C Cur Pos
^X Exit        ^J Justify     ^W Where Is    ^V Next Page   ^U UnCut Text  ^T To Spell
```

You can also configure the values of *mount_point_mp3*, *mount_point_vorbis*, *icecast_url*, *icecast_description*, and *icecast_genre* to suit your station.

If you require direct output to an ALSA soundcard device on the Airtime server, in addition to the Icecast stream, change the value of *output_sound_device* from the default of *false* to *true*:

```
output_sound_device = true
```

If you do not require an Icecast stream in either Ogg Vorbis or MP3 format, you can set the values of *output_icecast_vorbis* or *output_icecast_mp3,* respectively, to *false*. Then save and close the file with Ctrl+O and Ctrl+X.

Optionally, you may wish to edit the file */var/lib/airtime/application/configs/config.php* to set the directory where Airtime media files are stored. For example, you may wish to store media on a RAID array which is not part of the server's root filesystem.

```
$ sudo nano /var/lib/airtime/application/configs/config.php
```

Find the line which begins *$baseFilesDir* and change the directory path to the one that you require, for example:

```
$baseFilesDir = __DIR__.'/mnt/raid10/media/';
```

In the same file, you can set the URL which will be used to access your Airtime server from outside your local network, if you choose to enable that option. Find the line in the *config.php* file which begins *'storageUrlHost'* and change the domain name from the default of *localhost*. For example:

```
'storageUrlHost'        => 'airtime.example.com',
```

You can also set the web server port and the user name that the web server runs as here, if you are using non-standard settings. Save and close the file with Ctrl+O and Ctrl+X.

```
  GNU nano 2.2.4                    File: conf.php                               Modified

<?php
define('AIRTIME_VERSION', '1.7.0 alpha');
define('AIRTIME_COPYRIGHT_DATE', '2010-2011');

// These are the default values for the config.
global $CC_CONFIG;
$values = load_airtime_config();

// ***********************************
// ***** START CUSTOMIZING HERE *****
// ***********************************

// Set the location where you want to store all of your audio files.
//
// For example:
// $baseFilesDir = '/home/john/radio-files';
$baseFilesDir = __DIR__.'/mnt/raid10/media/';

$CC_CONFIG = array(

    // Set the URL of your installation
        'storageUrlHost'        => 'localhost',
    'storageUrlPort'        => 80,

    // Name of the web server user
    'webServerUser' => 'www-data',

// ***********************************************************************
        // STOP CUSTOMIZING HERE
        //
        // You don't need to touch anything below this point.
        // ***********************************************************************

^G Get Help    ^O WriteOut    ^R Read File   ^Y Prev Page   ^K Cut Text    ^C Cur Pos
^X Exit        ^J Justify     ^W Where Is    ^V Next Page   ^U UnCut Text  ^T To Spell
```

Then enter the following commands to create the Airtime databases, tables, and directories:

```
$ cd /var/lib/airtime/install/
$ sudo php airtime-install.php
```

Finally, reboot your server so that *daemontools* can initialize correctly.

Setting the server time

Accurate time keeping on your server is vital for optimal Airtime performance. You can confirm that the date and time of your server are set correctly with the *date* command:

```
$ date
```

The server should respond with the date, time, time zone and year in a format similar to the following example:

```
Mon Mar  7 14:59:17 GMT 2011
```

The time zone reported should match the continent and city that you set in the *php.ini* file during Airtime installation, such as *GMT* in the example above matching *Europe/London*. If not, see the section **Adjusting the server time zone** below.

Although it is possible to set the date and time of the server manually, this is not recommended because the server clock can drift over time, compromising the accuracy of your broadcast schedule. If your Airtime server is permanently connected to the Internet, you can synchronize your server to a time server with the *ntp* program. If *ntp* is not yet installed, you can enter the following command on Debian or Ubuntu:

```
$ sudo apt-get install ntp
```

Optionally, open the *ntp* configuration file in the *nano* editor to add further time server names:

```
$ sudo nano /etc/ntp.conf
```

On Ubuntu GNU/Linux, the default time server is *ntp.ubuntu.com*, but there are many other time servers available on the public Internet, including the group of servers listed at http://www.pool.ntp.org/ for each country. Using a variety of NTP servers located closely to your Airtime server will produce the most accurate results. For example, for a server in the United Kingdom you could use the following list:

```
# You do need to talk to an NTP server or two (or three).
server ntp.ubuntu.com
server 0.uk.pool.ntp.org
server 1.uk.pool.ntp.org
server 2.uk.pool.ntp.org
server 3.uk.pool.ntp.org
```

Enter the server names you require, press Ctrl+O to write out the */etc/ntp.conf* file, then Ctrl+X to exit *nano*. Restart the *ntp* service with:

```
$ sudo service ntp restart
```

The server should respond:

```
* Stopping NTP server ntpd                                          [ OK ]
* Starting NTP server ntpd                                          [ OK ]
```

Then use the *ntpq -p* command to confirm that ntp is working. This command should produce output similar to the following screenshot:

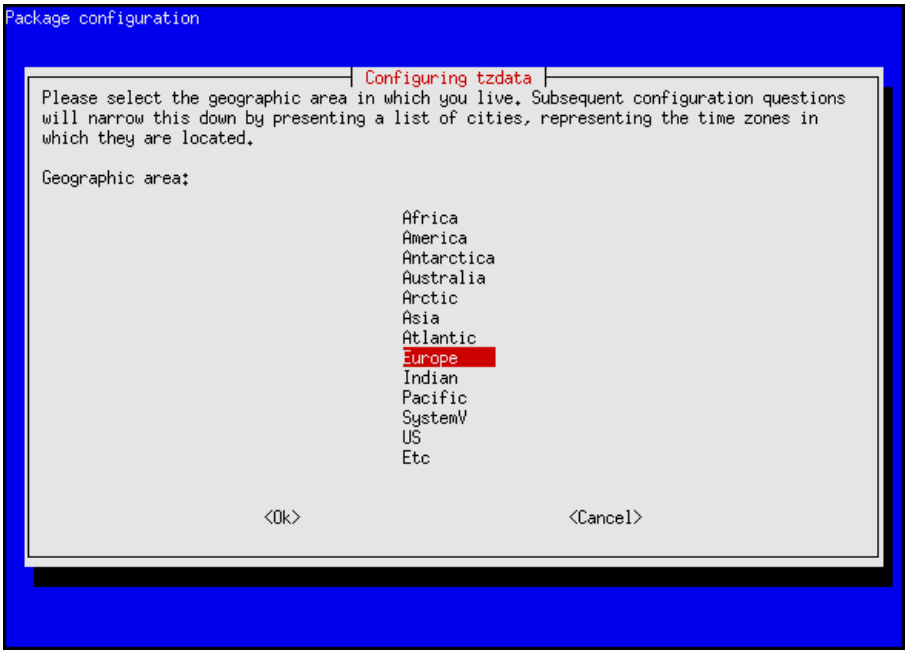
```
daniel@office:~$ ntpq -p
     remote           refid      st t when poll reach   delay   offset  jitter
==============================================================================
 europium.canoni 193.79.237.14    2 u   49   64    3  131.386  141.365   1.328
 dnscache-slough 213.222.193.35   2 u   45   64    3   23.594   84.480  31.209
 ntp2.exa-networ 195.66.241.10    2 u   45   64    3   32.222   87.153  61.082
 time.xilo.net   194.35.252.7     2 u   45   64    3   24.055   86.010  19.211
 mantaray.netine 249.240.53.144   2 u   46   64    3   24.754   91.331  65.929
daniel@office:~$
```

Adjusting the server time zone

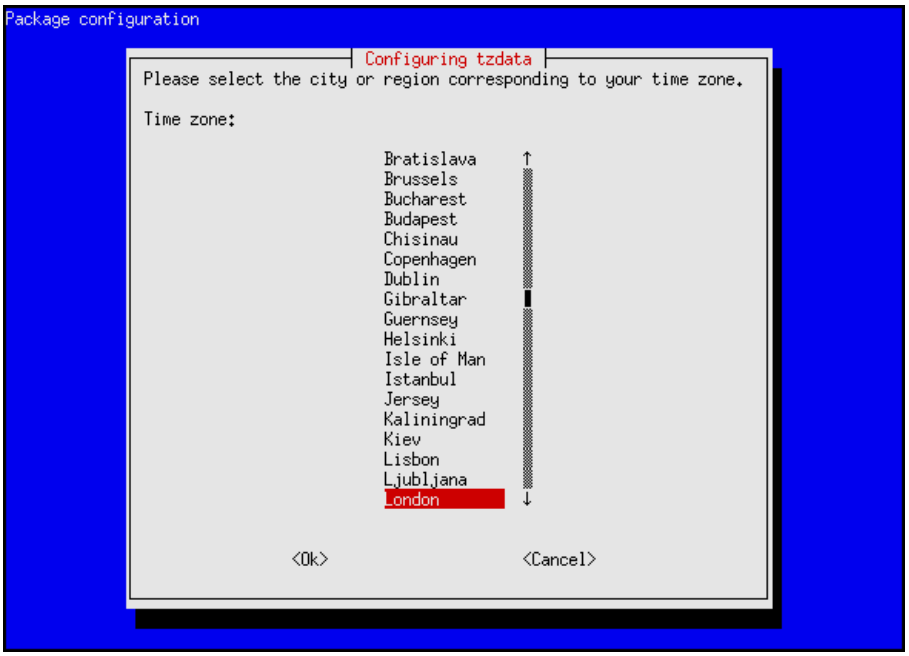
If your server is set to a different time zone than the one that you set during Airtime installation, your broadcast schedule may be played out at incorrect times. The data center which hosts your Airtime server could be located anywhere in the world. Some servers are set to Coordinated Universal Time or UTC (similar to Greenwich Mean Time or GMT), regardless of their location. If this is not appropriate for your station, on a Debian or Ubuntu server you can reconfigure the *tzdata* (time zone data) package with the command:

```
$ sudo dpkg-reconfigure tzdata
```

This command opens a menu in which you can select the continent that you require, by pressing the Enter key.



The next step is to select your nearest city, again by pressing the Enter key. The appropriate time zone is selected according to the information that you have entered.



The console output from the *dpkg-reconfigure tzdata* command will confirm the new setting.

```
Current default time zone: 'Europe/London'
Local time is now:      Mon Mar  7 15:04:58 GMT 2011.
Universal Time is now:  Mon Mar  7 15:04:58 UTC 2011.
```

Using the import script

If you have a large number of files in your media library, importing these files one at a time into a broadcast automation system would be time-consuming and tedious. That's why Airtime includes a script that can import an entire directory of files in one go.

Copying versus linking

You must specify one of two options for using the import script: Either to **copy** files into Airtime's storage server, or to **link** to files elsewhere. Each option has advantages and disadvantages, so you will have to think about how the files will be used in your station long-term.

- For files that are *copied*, you may run into problems with hard disk space if you do not remove files from the storage server periodically.
- For files that are *linked*, you must make sure that the files are actually going to be there at playout time, otherwise they will be skipped. For this reason, it is not recommended to use the link option for easily-removable storage (like MP3 players or USB memory sticks). There's a strong likelihood that the storage might be unplugged and taken away before playout time. It is also important to make sure that any external hard disk with linked files is powered on, and stays on.

The import script works from the command line, so you must first log into a console on the Airtime server. Then change to the *utils* directory beneath the directory where Airtime is installed, for example:

```
$ cd /var/lib/airtime/utils
```

You need to specify the full file system path to the media files that you wish to import. Copying is specified by including the -c switch in the command:

```
$ sudo ./airtime-import -c /<path>/<to>/<your>/<files>
```

Linking is specified by using the -l switch instead:

```
$ sudo ./airtime-import -l /<path>/<to>/<your>/<files>
```

If the import is successful, the script will report the names of the files imported.

```
daniel@office:/var/lib/airtime/utils$ sudo ./airtime-import -l /home/daniel/Music/strutsampler
[sudo] password for daniel:
=======================
Airtime Import Script
=======================
Importing: [00001] /home/daniel/Music/strutsampler/01 Love Dancing.mp3
Importing: [00002] /home/daniel/Music/strutsampler/02 Dat Soca Boat.mp3
Importing: [00003] /home/daniel/Music/strutsampler/03 My Oasis.mp3
Importing: [00004] /home/daniel/Music/strutsampler/04 Love And Death.mp3
Importing: [00005] /home/daniel/Music/strutsampler/05 (Do The) Spanish Hustle (Danny Krivit).mp3
Importing: [00006] /home/daniel/Music/strutsampler/06 Electricone.mp3
Importing: [00007] /home/daniel/Music/strutsampler/07 Cherchez Pas.mp3
Importing: [00008] /home/daniel/Music/strutsampler/08 Emakhaya.mp3
Importing: [00009] /home/daniel/Music/strutsampler/09 Wozani Mahipi.mp3
Importing: [00010] /home/daniel/Music/strutsampler/10 Green Africa.mp3
========================================================================
 *** Import mode: link
 *** Files imported: 10
 *** Duplicate files (not imported):
 *** Total: 10 files in 3 seconds = 3.3 files/second.
========================================================================
daniel@office:/var/lib/airtime/utils$
```

If you do not have write access to the filesystem, or the files are duplicates of files that have already been imported, the script will warn you with an error message.

Metadata quality

The *airtime-import* script automatically imports any metadata that is in the files' ID3 tags. If these tags are incorrect or are missing information, you will have to either edit the metadata before importing them, or suffer the consequences. For example, if the tags have artist or genre metadata missing, it will be impossible to search for, playlist or schedule the media according to these criteria.

The program **Audio Tag Tool** can be useful for batch setting and editing ID3 tags before importing files into your Airtime server. On an Ubuntu desktop machine, you can install Audio Tag Tool with the command:

```
$ sudo apt-get install tagtool
```

After installation, you can run the program with the command:

```
$ tagtool
```

The *Tag Multiple Files* feature of the Audio Tag Tool program is a particularly useful time saver if you have a large archive of untagged files. Sometimes there is artist or title information in the filename, which can be converted into an ID3 tag automatically.

USING AIRTIME

Getting started

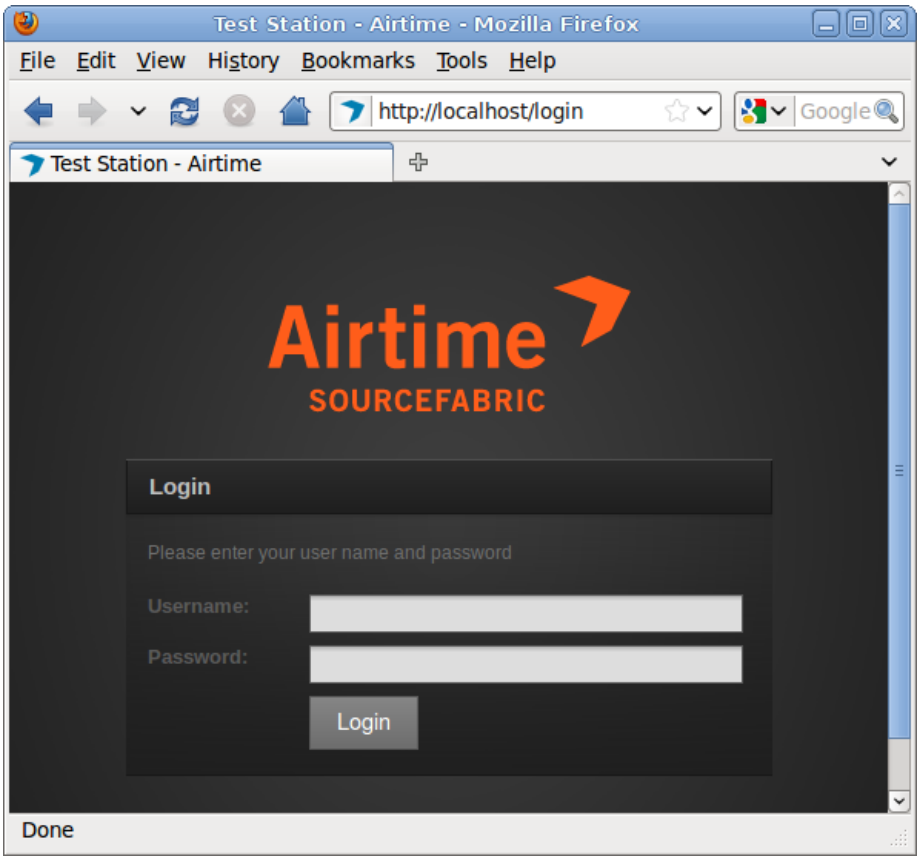
If the Airtime server has a web browser installed, you can access the administration interface by opening the address:

```
http://localhost/login
```

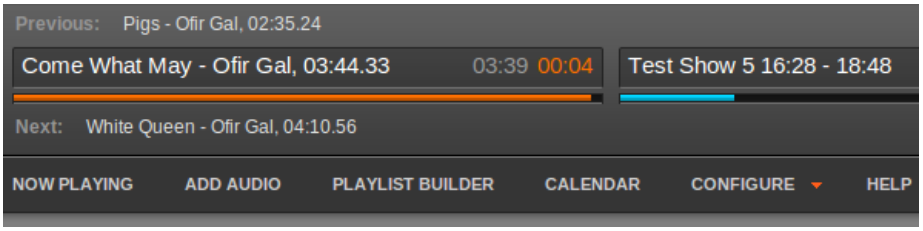
If you have set up Airtime so that it can be accessed from other computers, you would use a domain name. For example:

```
http://airtime.example.com/login
```

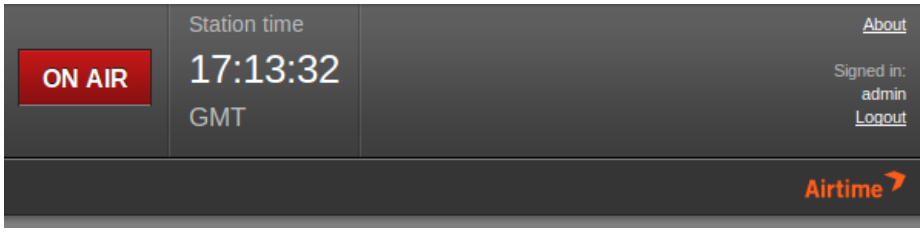
You can log in for the first time with the username *admin* and password *admin*.



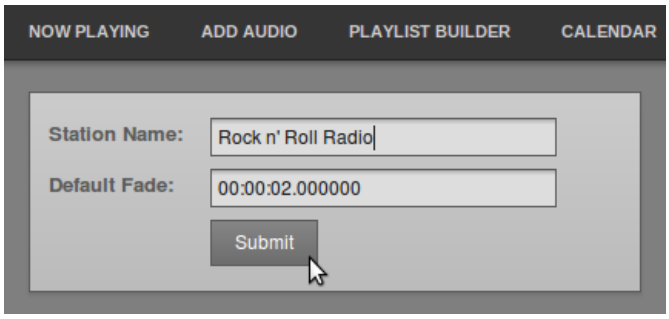
After you have logged in, you should see the **Master Panel**, which is present at the top of every page of the Airtime interface. On the left hand side, the Master Panel displays the details of the previous file played out, the current file playing (with an orange progress bar), and the next file due to play. It also displays the name and scheduled time of the current show, with a blue progress bar. Beneath this side of the Master Panel is the main navigation menu, with sub-menus labeled **Now Playing**, **Add Audio**, **Playlist Builder**, **Calendar**, **Configure** and **Help**. We'll be looking at the contents of these menus in the following chapters of this manual.



On the right hand side, the Master Panel features an **On Air** indicator, which turns from gray to red whenever a file is being played out. There is also a clock indicating the **Station time** and time zone. Over on the far side, an **About** link opens a pop-up window with some information about Airtime. The name of the user currently logged in is displayed, and below this there is the link to **Logout**.



On the **Configure** menu, click **Preferences** to set your **Station Name** and the **Default Fade** time that you would like to set for automated crossfades. Then click the **Submit** button.

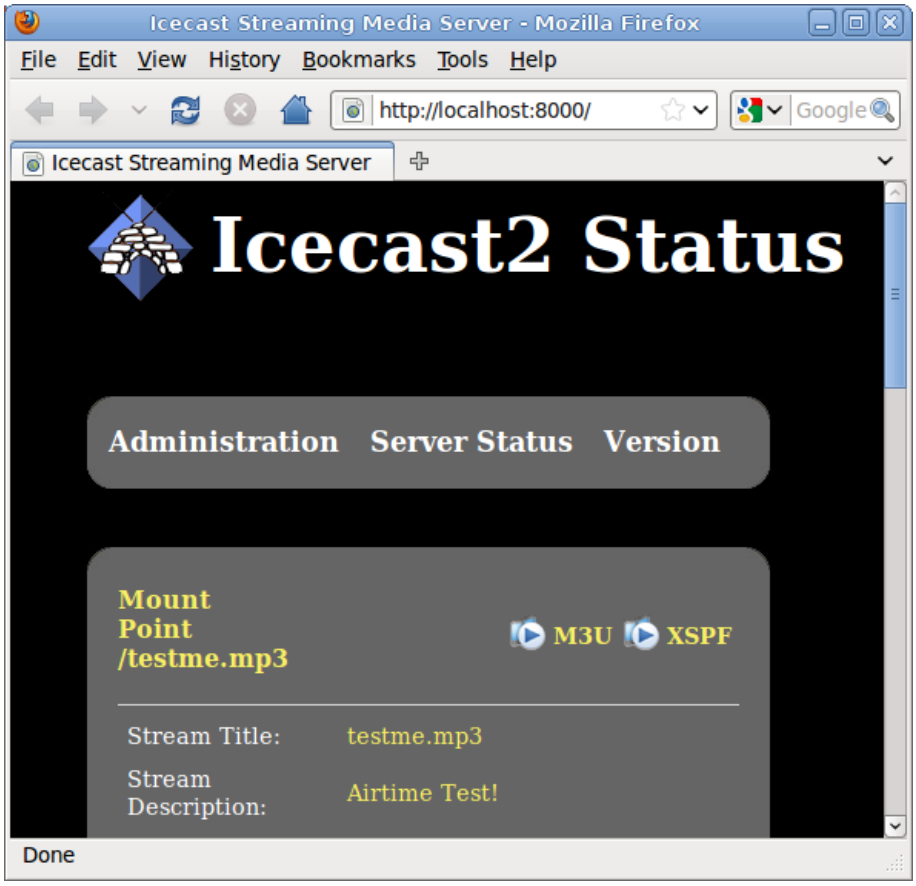


Checking the stream

If you have enabled the streaming option when you installed Airtime, you can check that the Icecast server is running by opening port 8000 of the server in your web browser. For example, on the server itself, you can use:

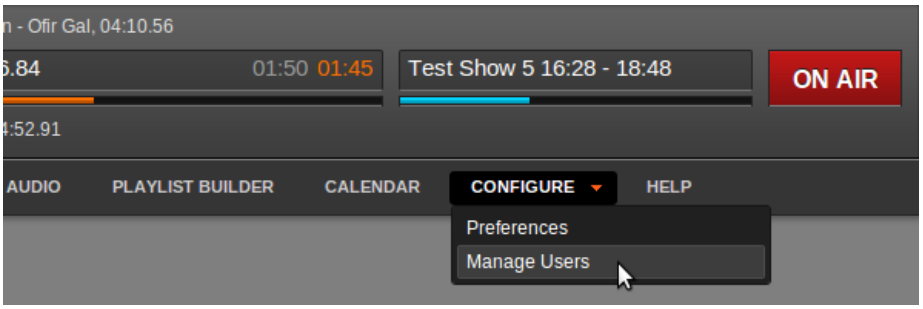
```
http://localhost:8000/
```

You should see the Icecast status page, with details of the connection that Airtime has made to Icecast. If you have only just installed Airtime, there won't be any media playing out yet.

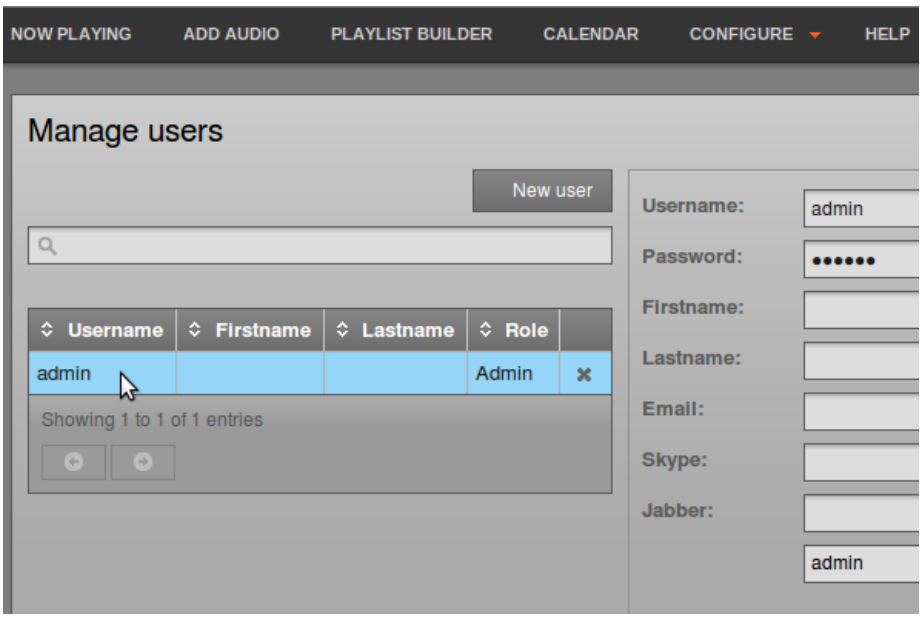


Managing users

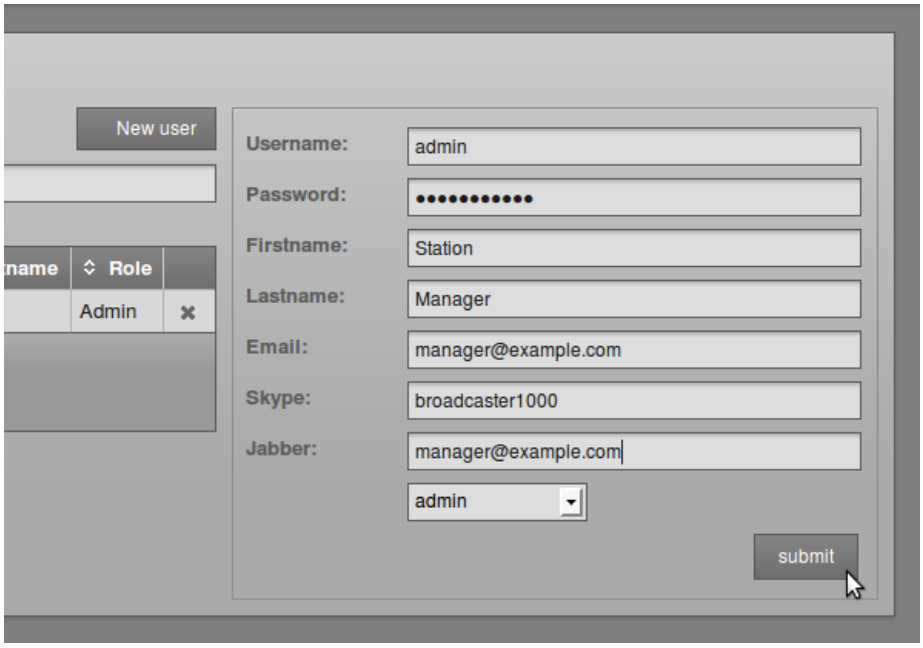
You should set a new administrator password immediately, using the **Manage Users** entry on the **Configure** menu.



On the left hand side of the **Manage Users** page, click on *admin* in the user list. The details for this user will appear in the box on the right hand side. At the moment, the *admin* user only has a **Username** and a **Password**.



Enter a secure password (as long and as varied as is practical) into the **Password** field. Keeping this password secure is essential for the smooth running of your station, because it enables access to all scheduling and management features. You can also enter other details for your user account on this page, including your full name and contact details. Then click the **Submit** button.



To add further user accounts to the system, one for each of your station staff that need access to Airtime, click the **New user** button. Enter a username, password and contact details, and then select the user **Role** from the drop down menu, which can be *admin*, *host*, or *guest*. The difference between these roles is:

- An *admin* (station manager) has read and write access to all the features of Airtime. This role should be reserved for trusted staff members only.
- A *host* (presenter, or DJ) only has write access to features related to the specific shows assigned to them by an *admin*. The *host* can read data for other shows, but not write to them. This read access to other shows helps hosts plan their own shows, for instance avoiding the scenario where two DJs play the same music by coincidence.
- A *guest* can log in to read the forthcoming schedule or playlists, but has no write permission for any feature. The group of guests might include the station accountant, or the show assistants.

New users that you add will be shown in the list on the left-hand side of the **Manage Users** page. If you have a large number of users on the system, you can use the search tool above the list (which has a magnifying glass icon) to identify specific user accounts. Click on the list headings to sort the search results by *Username*, *Firstname*, *Lastname* or *Role*. To remove a user account, click the small **x** icon to the right side of its row in the list.

Now playing

This page provides two views of the files your station is playing, which can be switched using the **Day View** and **Now View** buttons in the top right corner of the administration interface. If you've only just installed Airtime, there won't be any files shown in either view yet.

The default is **Now View**, in which files that have already been played are removed from the top of the list. The row for the currently playing file is shown with an orange background. Any empty slots in the schedule are shown with a red background.

NOW PLAYING ADD AUDIO PLAYLIST BUILDER CALENDAR CONFIGURE HELP

Date	Start	End	Duration	Song	Artist	
2011-03-17	16:25:00	16:31:01.29	00:06:01.29	Love Dancing	Arthur's Landing	Stru
2011-03-17	16:31:01.29	16:35:19.66	00:04:18.37	Баллада № 1 (женский романс)	Ильмера	Сек
2011-03-17	16:35:19.66	16:39:02.32	00:03:42.66	WO QUI NON COIN / COWBOY BEBOP	Aoi Tada	Spa
2011-03-17	16:39:02.32	16:41:27.28	00:02:24.95	Respect	Aretha Franklin	I Ne Wa
2011-03-17	16:41:27.28	16:45:06.75	00:03:39.47	Cherry Blossom Girl	Air	Tall
2011-03-17	16:45:06.75	16:48:06.18	00:02:59.43	Seven Nation Army	Ben L'Oncle Soul	Ben
2011-03-17	16:48:06.18	16:52:01.57	00:03:55.39	Warlock	Desmond Dekker	Roc of D
2011-03-17	16:52:01.57	00:00:00	07:07:58.42	-	-	-

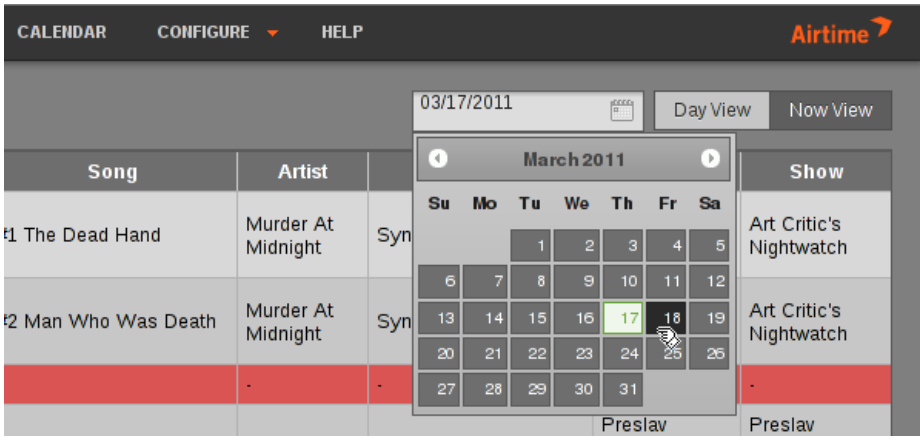
On the right hand side of the **Now View**, the **Playlist** and **Show** that each file is a part of is displayed. (Creating playlists and shows is covered in later chapters of this manual).

CALENDAR CONFIGURE HELP Airtime

Day View Now View

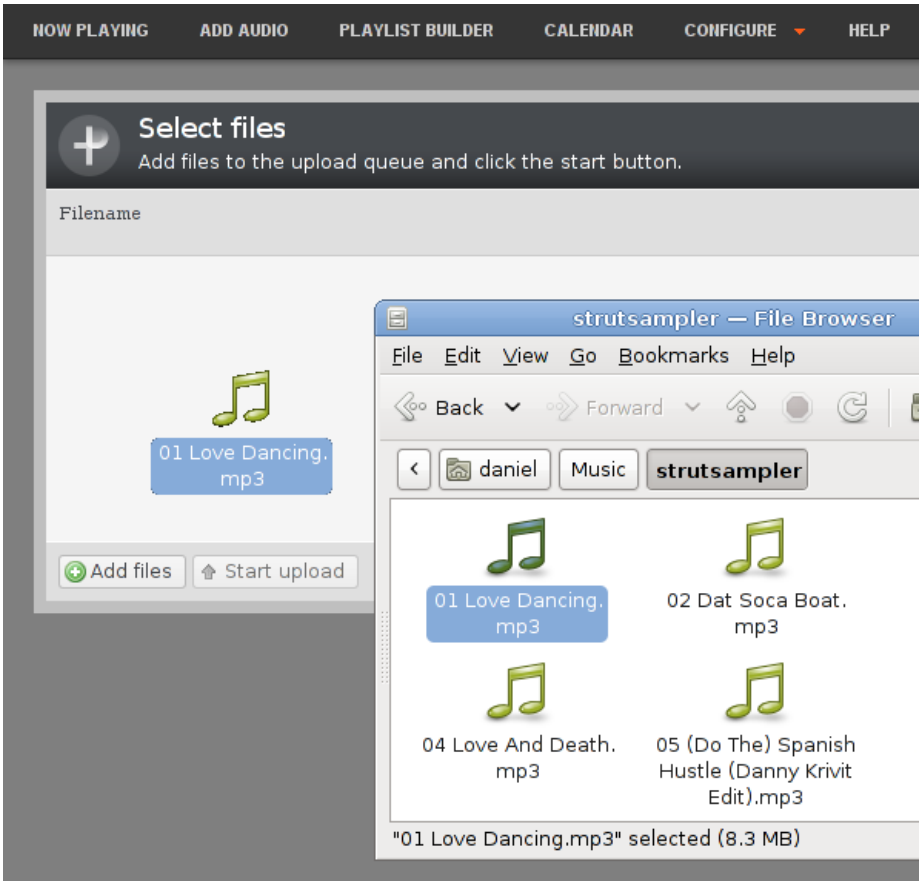
Song	Artist	Album	Playlist	Show
Love Dancing	Arthur's Landing	Strut Sampler 2011	My playlist	Test Show
Баллада № 1 (женский романс)	Ильмера	Секреты	My playlist	Test Show
WO QUI NON COIN / COWBOY BEBOP	Aoi Tada	Space Bio Charge	My playlist	Test Show
Respect	Aretha Franklin	I Never Loved A Man the Way I Love You	My playlist	Test Show
Cherry Blossom Girl	Air	Talkie Walkie	My playlist	Test Show
Seven Nation Army	Ben L'Oncle Soul	Ben L'Oncle Soul	My playlist	Test Show
Warlock	Desmond Dekker	Rockin' Steady The Best of Desmond Dekker	My playlist	Test Show
-	-	-	-	-

The **Day View** is similar to the **Now View**, except that files which have already played out are shown at the top of the window. You can select which day of the schedule you wish to view by clicking on the date box, just to the left of the **Day View** button, and selecting a day from the pop-up calendar.

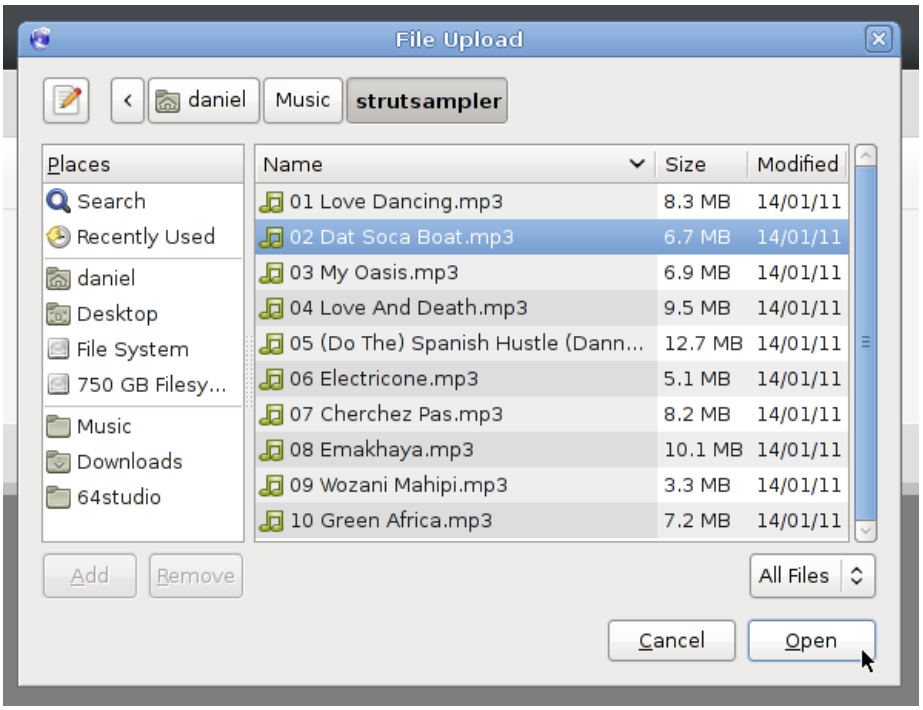

CALENDAR
CONFIGURE
HELP
Airtime
03/17/2011
Day View
Now View
March 2011
Su Mo Tu We Th Fr Sa
Song
Artist
Show
1 The Dead Hand
Murder At Midnight
Art Critic's Nightwatch
2 Man Who Was Death
Murder At Midnight
Art Critic's Nightwatch
Preslav
Preslav

Add audio

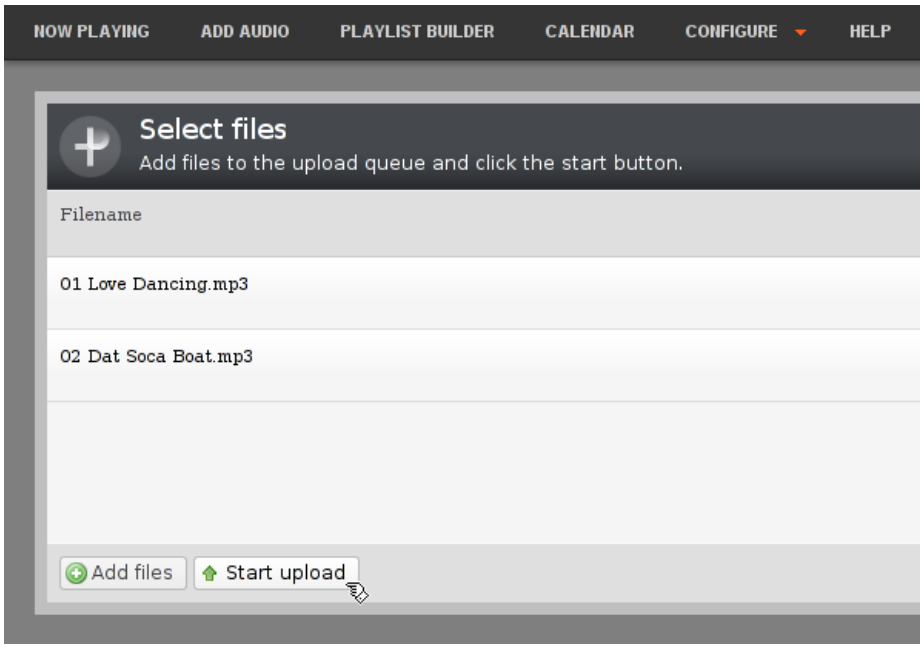
If you do not have access to the *airtime-import* script on the server, you can add files to the Airtime database using the **Add audio** page of the administration interface. This page includes an upload queue for files which supports drag and drop from your computer's file manager, if you are using the recommended *Firefox 3.6* web browser.



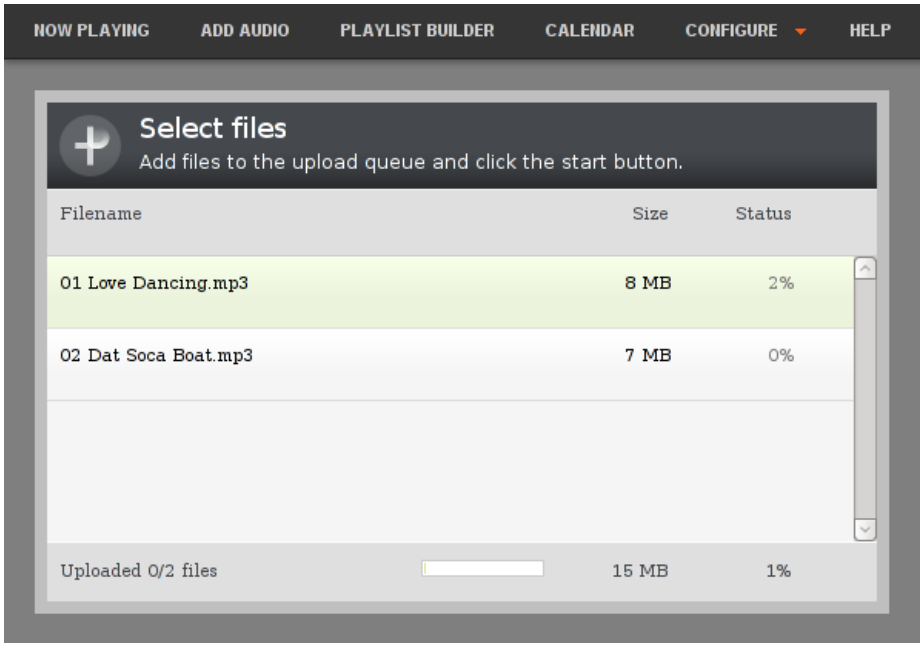
If your web browser does not support drag and drop, you can use the **Add files** button, which has a white plus sign in a green circle icon, to open a file selection window on your computer.



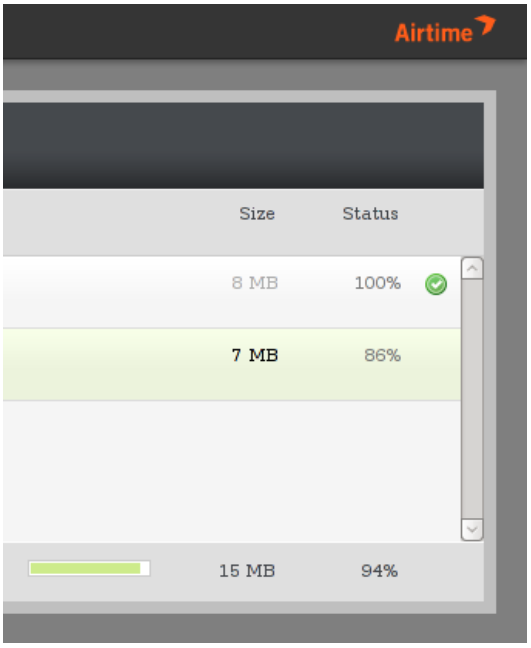
After you have added all the files that you require to the upload queue, click the **Start Upload** button, which has a green arrow icon.



The row of the file currently being uploaded is highlighted in pale green. At the bottom of the upload queue, a progress bar and percentage indicates how much of the upload has taken place so far.



Once it has been uploaded successfully, each file row displays a white check mark in a green circle icon.



Your files are now imported into the Airtime database, ready to be included in your broadcast playlist.

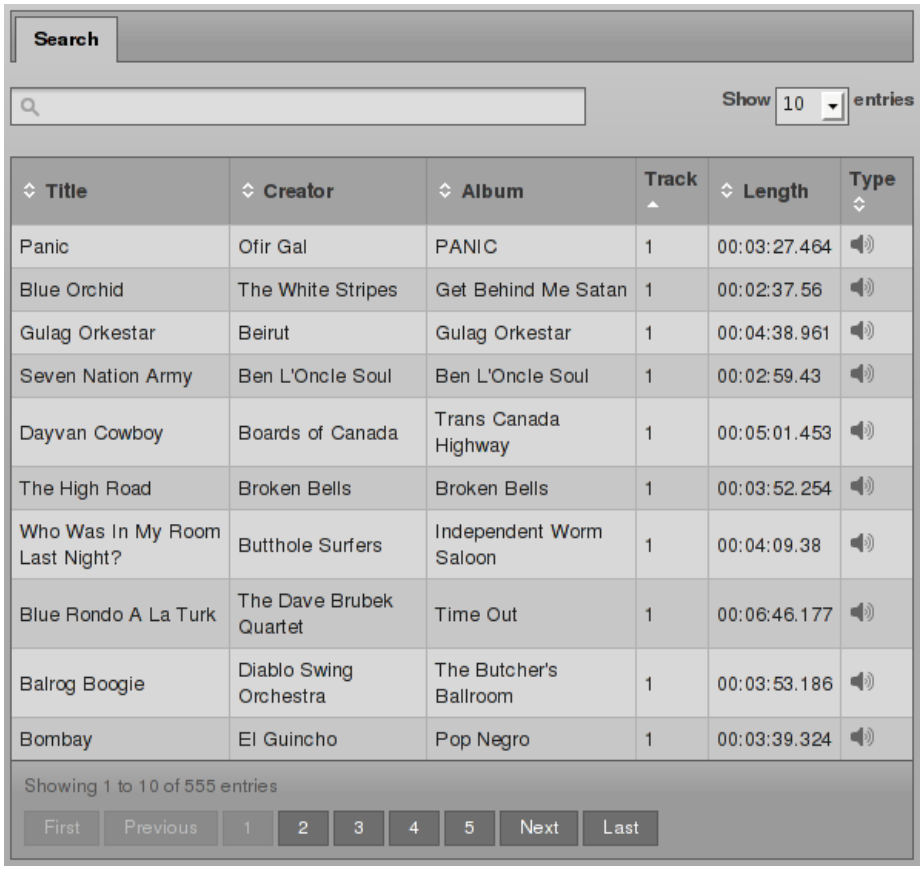
Playlist builder

This page of the Airtime interface enables you to search the media archive, sort and display the search results by the criteria that you choose, and drag and drop search results into an open playlist. You can also re-arrange the currently open playlist by dragging and dropping.

The Search tab

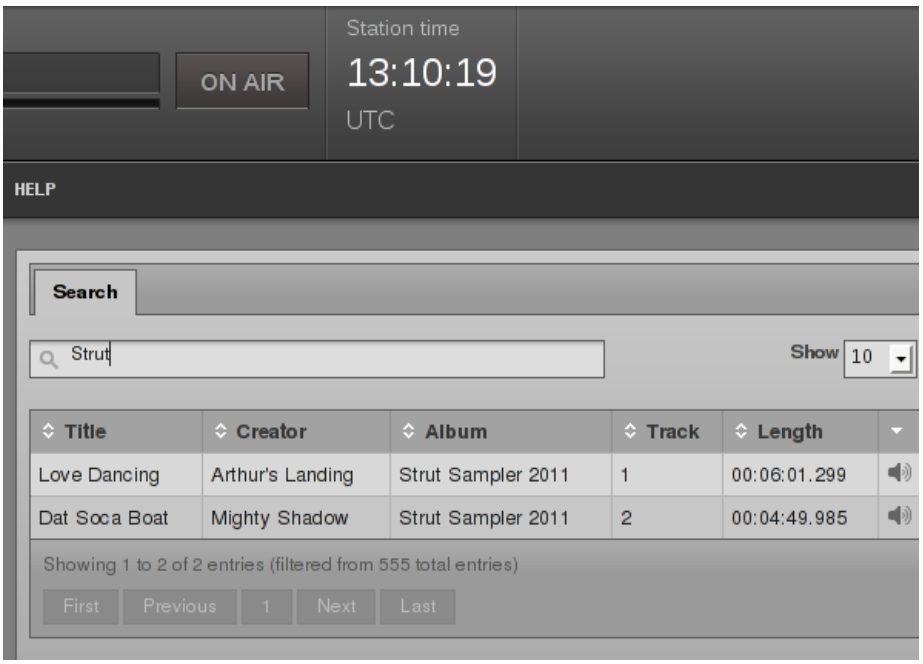
On the right hand side of the Playlist Builder page, the **Search** tab lists both the media and the playlists in the Airtime archive, with ten entries shown per page by default. Click on the **Show entries** drop-down menu in the top right corner to select the display of 10, 25, 50 or 100 entries per page, according to your preference.

Click the column headings **Title**, **Creator**, **Album**, **Track**, **Length** or **Type** to sort the entries. In the **Type** column, audio files are represented by a loudspeaker icon, while playlists are represented with a document icon. At the bottom of the window, click the **First**, **Previous**, **Next**, **Last** or page number buttons to browse the media archive.



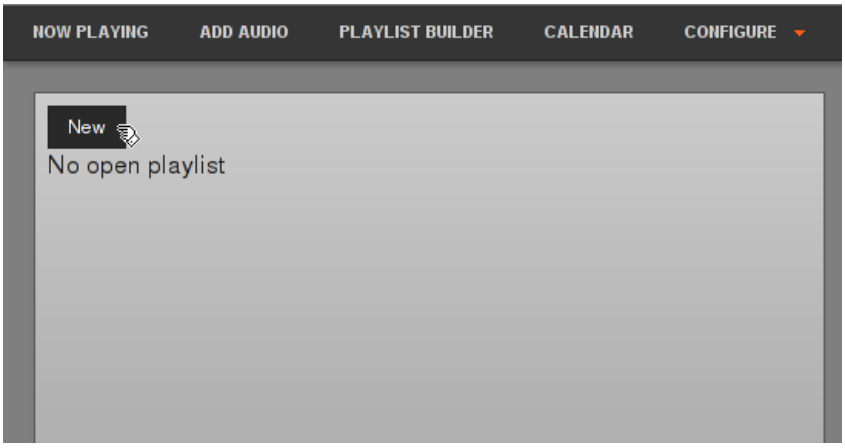
Title	Creator	Album	Track	Length	Type
Panic	Ofir Gal	PANIC	1	00:03:27.464	
Blue Orchid	The White Stripes	Get Behind Me Satan	1	00:02:37.56	
Gulag Orkestar	Beirut	Gulag Orkestar	1	00:04:38.961	
Seven Nation Army	Ben L'Oncle Soul	Ben L'Oncle Soul	1	00:02:59.43	
Dayvan Cowboy	Boards of Canada	Trans Canada Highway	1	00:05:01.453	
The High Road	Broken Bells	Broken Bells	1	00:03:52.254	
Who Was In My Room Last Night?	Butthole Surfers	Independent Worm Saloon	1	00:04:09.38	
Blue Rondo A La Turk	The Dave Brubek Quartet	Time Out	1	00:06:46.177	
Balrog Boogie	Diablo Swing Orchestra	The Butcher's Ballroom	1	00:03:53.186	
Bombay	El Guincho	Pop Negro	1	00:03:39.324	

Type a search term into the box in the upper left corner, with the magnifying glass icon. Like an Internet search engine, the filtered entries shown are refined as you type - there is no need to press the Enter key.

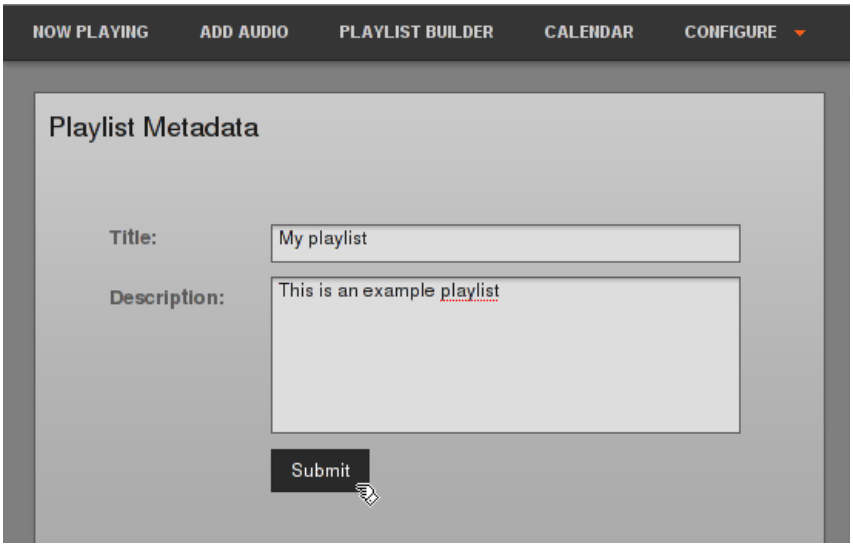


Creating a new playlist

Once you have found the media that you require using the **Search** tab, you can create a new playlist on the left hand side of the **Playlist Builder** page. Click the **New** button to begin.

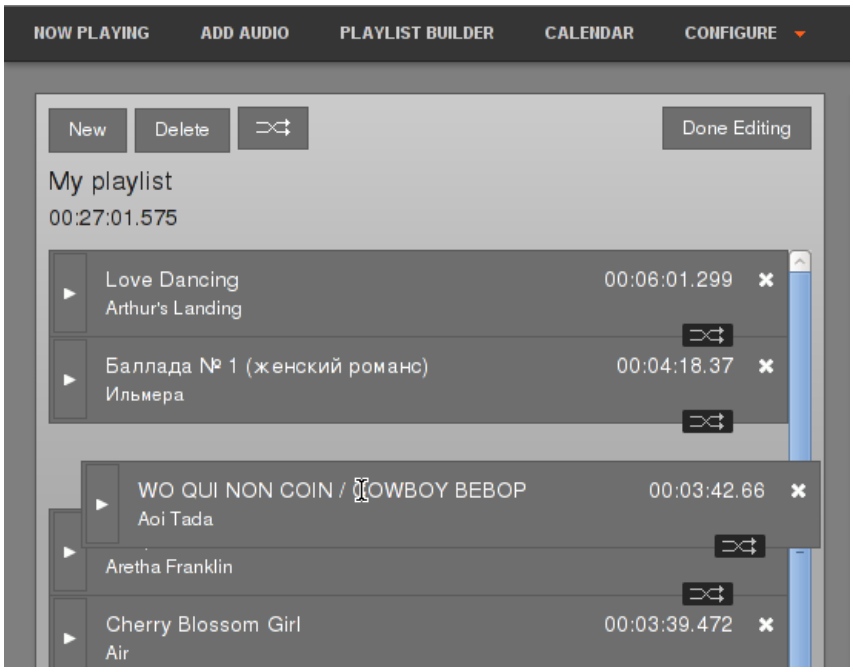


Enter a **Title** and **Description** for the playlist, then click the **Submit** button. Setting good quality metadata here will help you find the playlist using the **Search** tab later, so you should be as descriptive as possible.

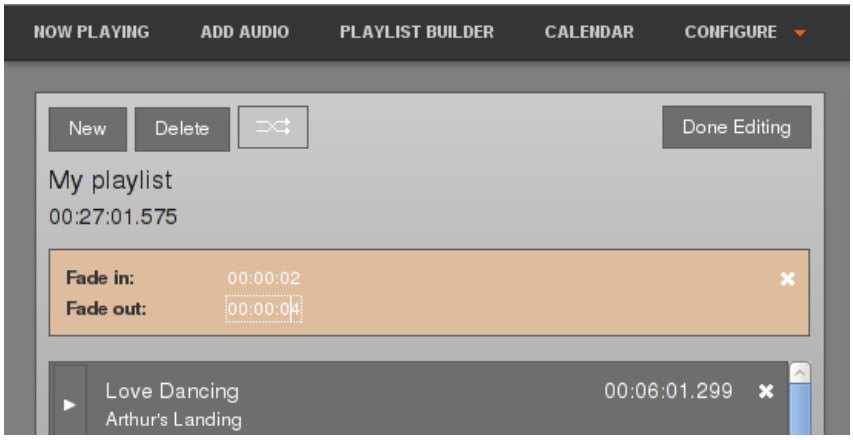


Next, drag and drop files from the Search tab into the new playlist.

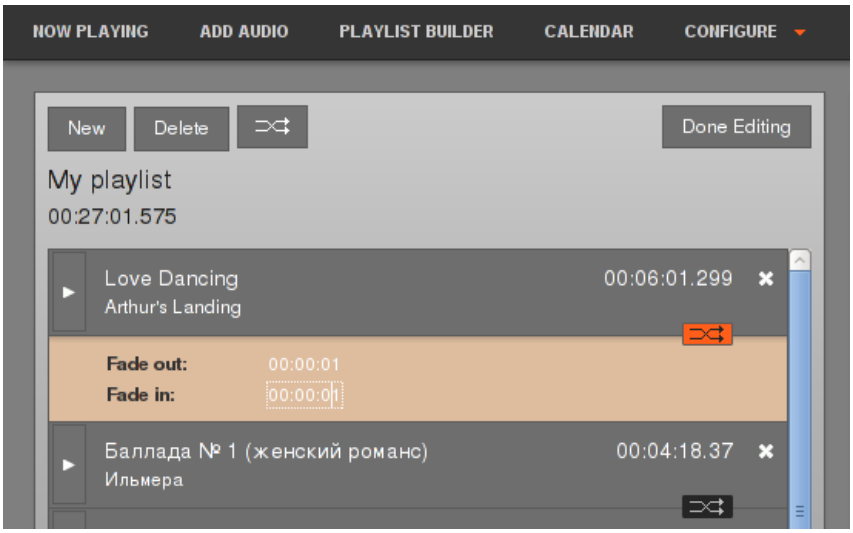
After dragging files into the new playlist, the total playlist time is displayed in the top left corner. Durations for individual files are shown in each row of the playlist. Click the small **x** icon on the right hand side of each row to remove a file from the playlist. You can also drag and drop files to re-order them.



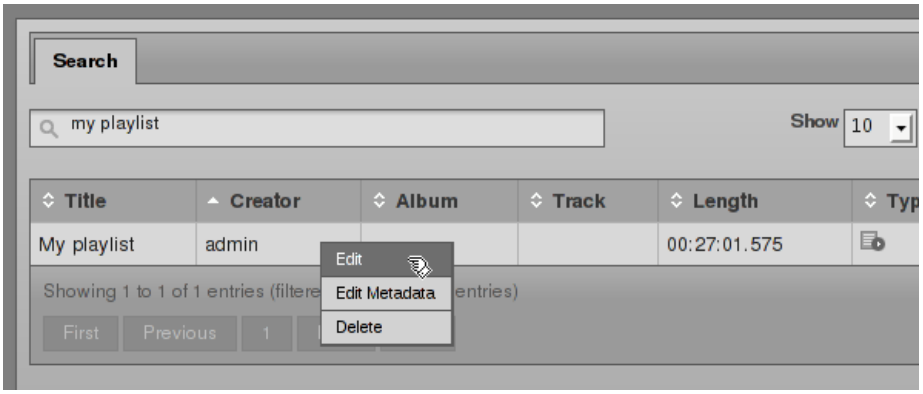
Click the playlist **Crossfade** button (two horizontal white arrows crossing in a gray rectangle), to the right of the **New** and **Delete** buttons, to open a beige bar in which you can set the **Fade in** and **Fade out** times for this playlist.



Click any one of the smaller **Crossfade** buttons between file rows to open a bar which enables you to set fade in and fade out times between two adjacent files in the playlist.

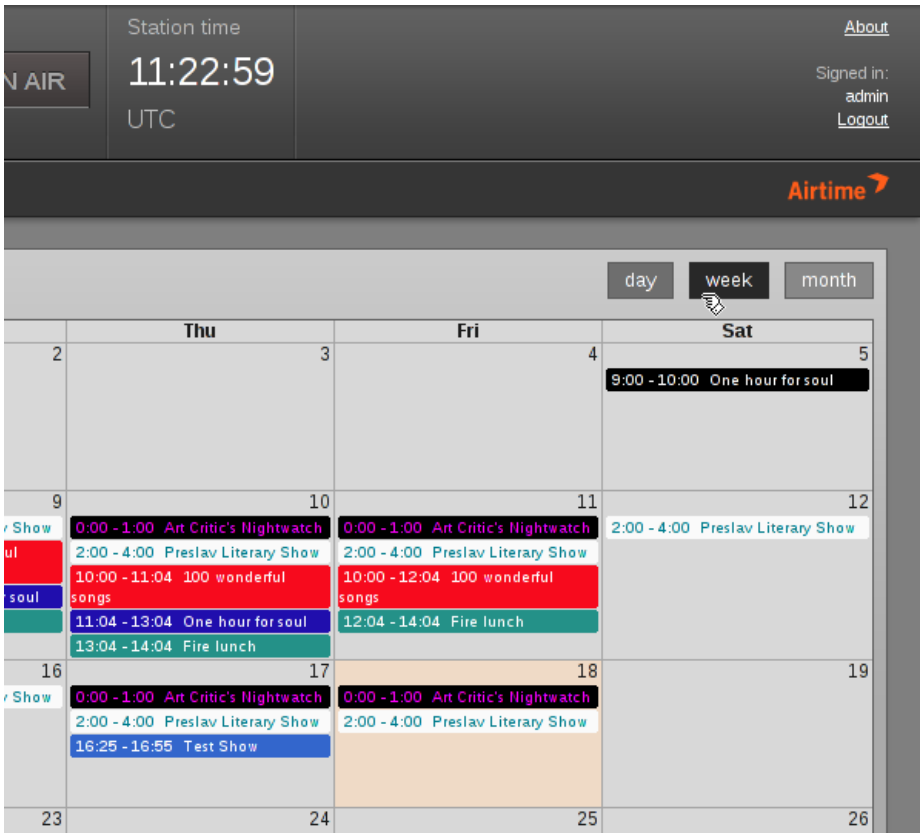


When your playlist is complete, click the **Done Editing** button. If you want to edit the playlist contents or the playlist metadata later, you can find it by **Title** or **Creator** using the **Search** tab. Right-click on the playlist in the search results list, and select **Edit** or **Edit Metadata** from the pop-up context menu. You can also **Delete** a playlist from this context menu.

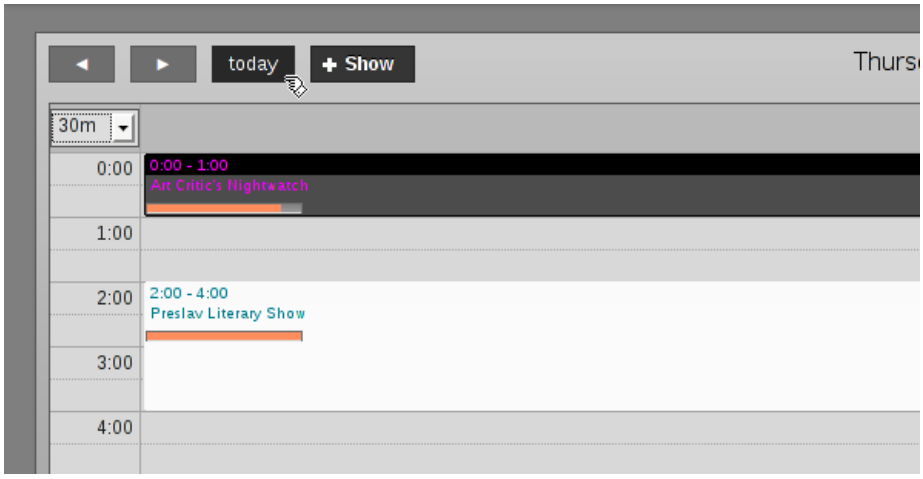


Calendar

This page of the Airtime administration interface has three views: **Day**, **Week** and **Month**, which can be switched using the gray buttons in the top right corner. By default, the **Month** view is shown, with today's date highlighted by a beige background.



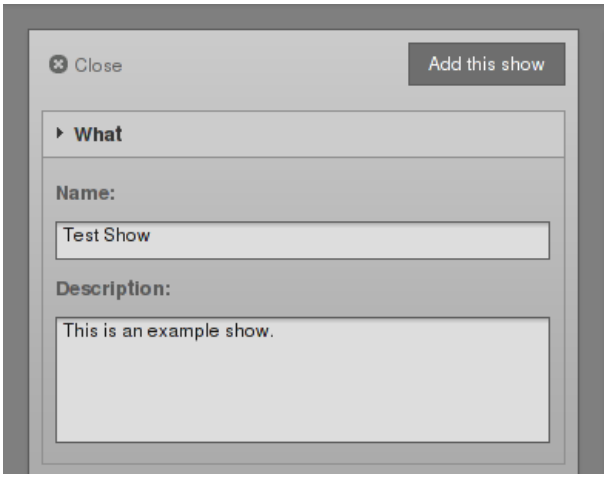
In the top left corner of the page, you can go back or forward through the **Calendar** by clicking on the small white triangle buttons. Click the **Today** button to jump to today's date in the current view. In the **Day** or **Week** views, there is also a drop-down menu which allows you to set the resolution displayed for the calendar, ranging from five minutes per row to sixty minutes per row.



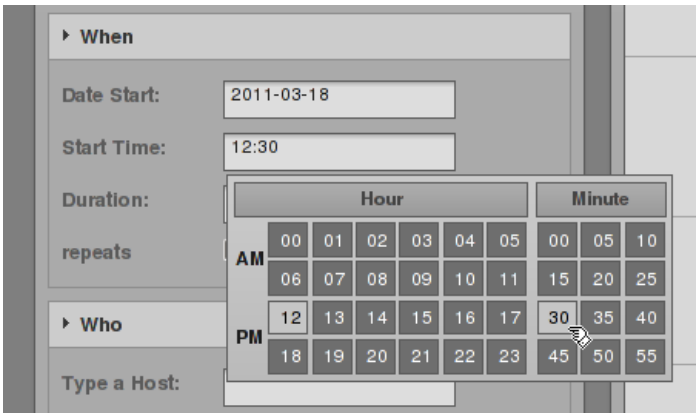
Adding a show

To add a new show to the calendar, click the **+ Show** button in the top left corner of the page, or click on any empty slot in the **Calendar** itself. Either of these actions opens the **Add this show** box, which has four sections, arranged vertically: **What**, **When**, **Who**, and **Style**. Click the small black triangle to the left of the section name if you wish to minimize it.

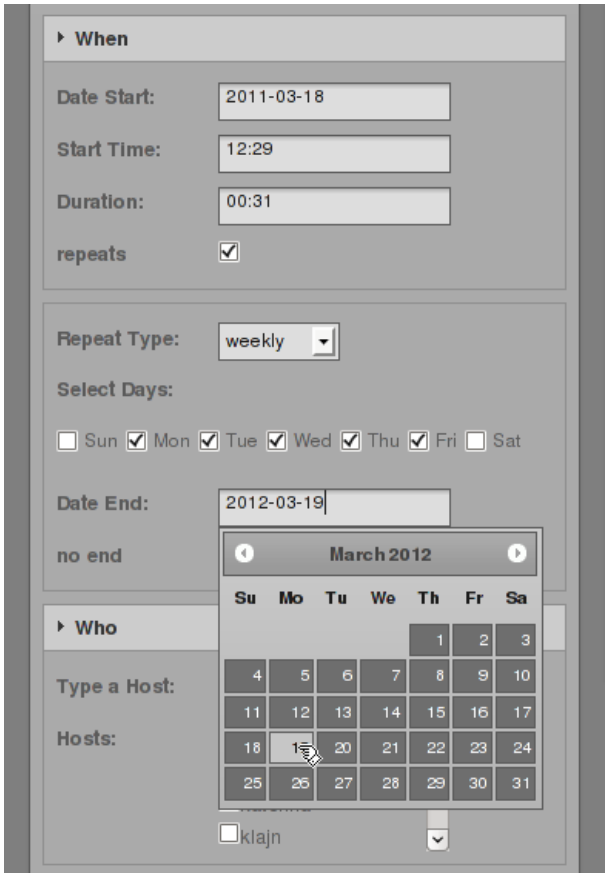
In the **What** box, enter the name and description for the show that you are creating.



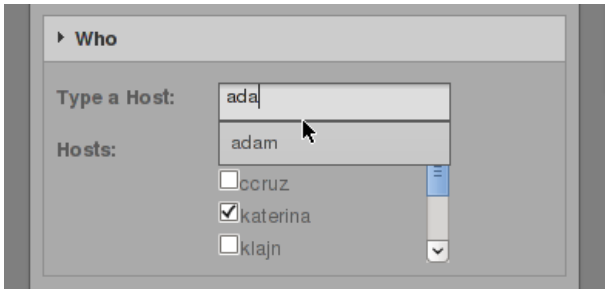
Next, in the **When** section, the date that you clicked on in the **Calendar** should already be entered in the **Date Start** field. To set another date for the show, click on the **Date Start** field and then select the alternative date that you require for the show from the small pop-up calendar. Then set the **Start time** and **Duration** for the show in the same way, with the pop-up **Hour** and **Minute** box. The minute values in the pop-up time boxes are rounded to the nearest five minutes, but you can adjust the times manually by clicking into the fields and typing.



To schedule a regular show, check the **Repeats** box and select either **Weekly**, **Bi-weekly** or **Monthly** from the **Repeat Type** drop-down menu that will appear. Then check the boxes for the days of the week that you want to schedule the regular show on. Set the **Date End** for the regular show to finish, or check the **No End** box to schedule the show indefinitely.

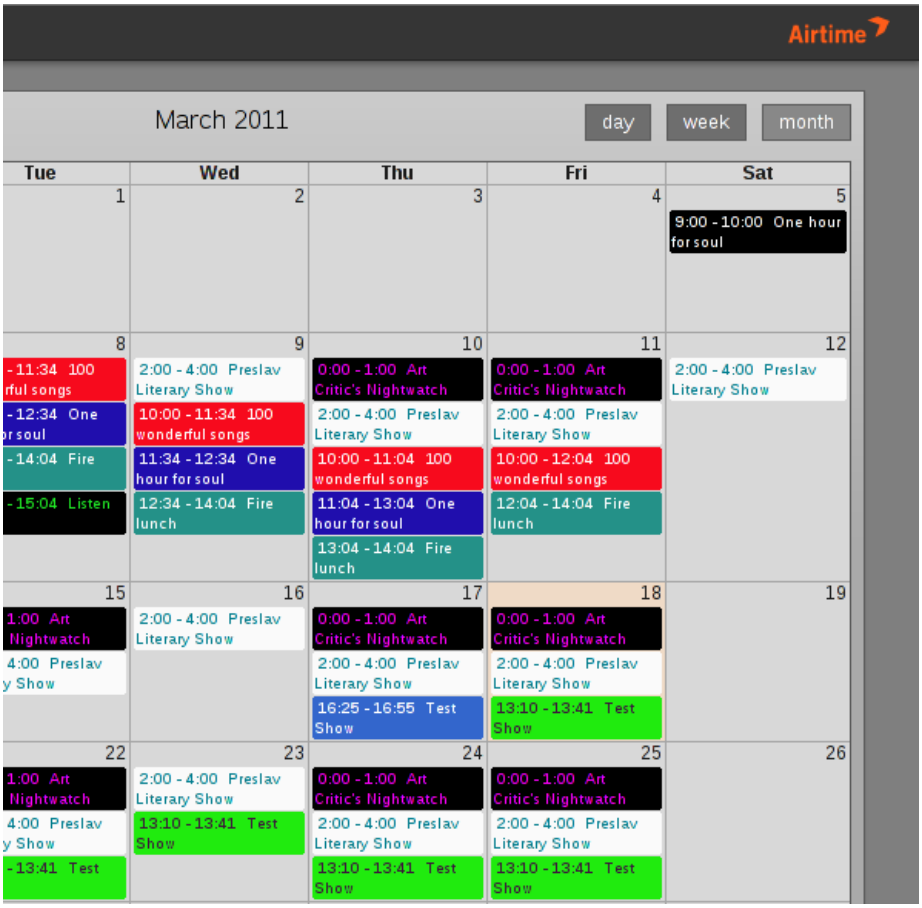


In the **Who** section, type the first few letters of the name of the show presenter to select a name from the database, or check one of the boxes in the vertical scrolling list below.



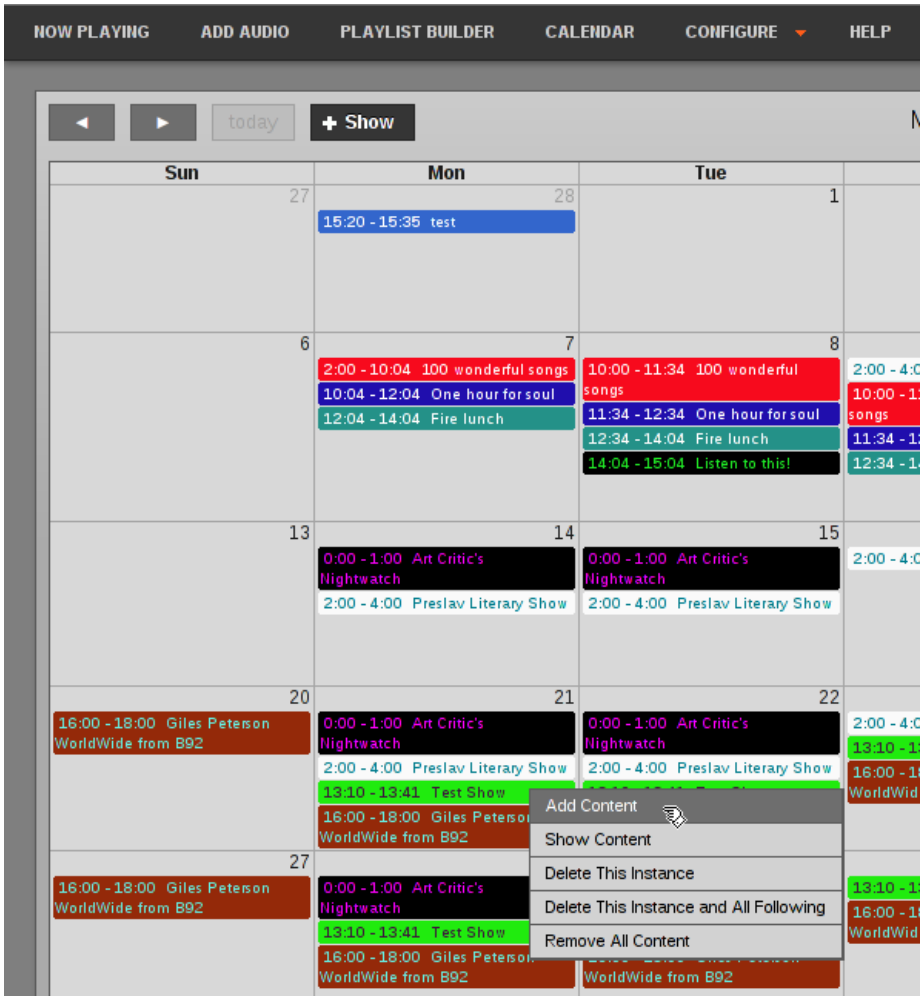
Finally, select a **Background Colour** and **Text Colour** from the **Style** section, so that the new show can be easily identified in the **Calendar**.

Click the **Add this show** button at the top of the box. The new show will now be displayed in the **Calendar**, with a regular slot if you have chosen to schedule one.

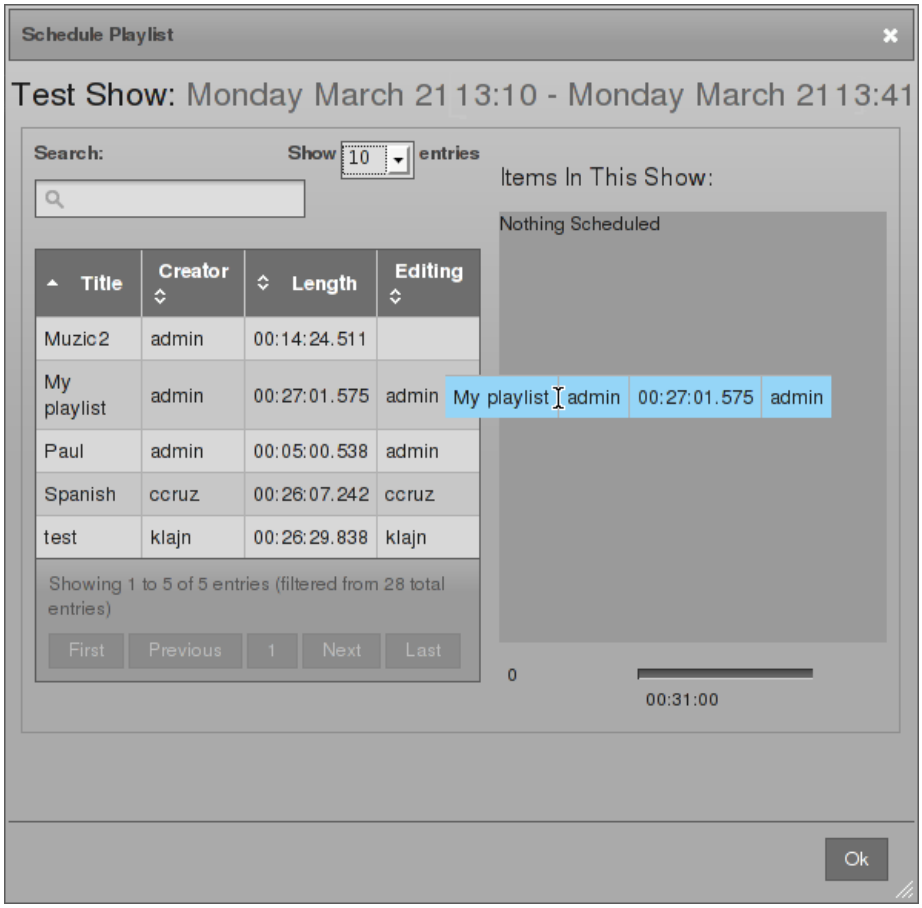


Adding content to a show

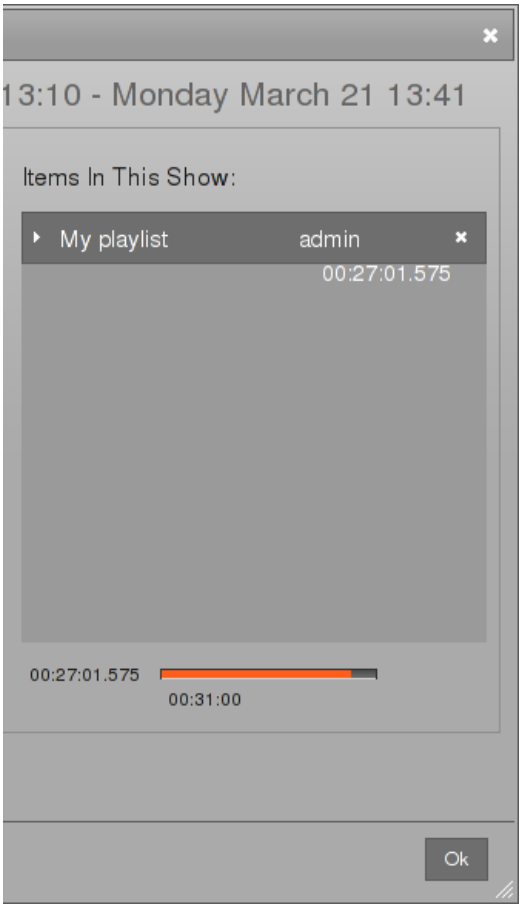
To add content to a show, right-click on it in the Calendar, and select Add Content from the pop-up context menu.



This action opens the **Schedule Playlist** pop-up window. Just like when using the **Playlist Builder** to find files, you can search for playlists and drag them into the **Items in this Show** box.



The orange progress bar underneath the **Items in this Show** box updates automatically to show how much time remains from the allocated show duration. Click the small white triangle on the left of each row to see details of the playlist, or click the white **x** icon on the right side to remove it from the show.



When your show has all the required content, click the **OK** button in the bottom right corner to close the window. Back in the **Calendar**, right-click on the show and select **Show content** from the pop-up context menu to view a list of content now included in the show. Click the **OK** button in the bottom right corner, or the **x** icon in the top right corner, to close this window.

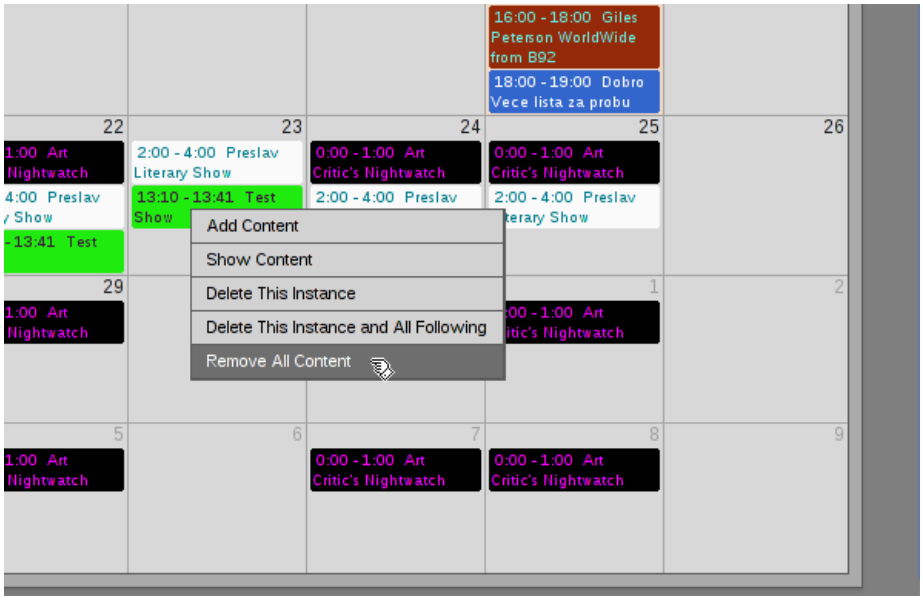
Show Contents

Start	Title	Creator	Album	Length	Genre
2011-03-21 13:10:00	Love Dancing	Arthur's Landing	Strut Sampler 2011	00:06:01.299	
2011-03-21 13:16:01.299	Баллада № 1 (женский романс)	Ильмера	Секреты	00:04:18.37	Blues
2011-03-21 13:20:19.669	WO QUI NON COIN / COWBOY BEBOP	Aoi Tada	Space Bio Charge	00:03:42.66	Anime
2011-03-21 13:24:02.329	Respect	Aretha Franklin	I Never Loved A Man the Way I Love You	00:02:24.953	Oldies
2011-03-21 13:26:27.282	Cherry Blossom Girl	Air	Talkie Walkie	00:03:39.472	Other
2011-03-21 13:30:06.754	Seven Nation Army	Ben L'Oncle Soul	Ben L'Oncle Soul	00:02:59.43	R&B
2011-03-21 13:33:06.184	Warlock	Desmond Dekker	Rockin' Steady The Best of Desmond Dekker	00:03:55.391	Ska

Ok

Removing content from a show

To remove an individual playlist from a show, right-click on the show in the **Calendar**, and select **Add Content** from the pop-up menu. In the **Schedule Playlist** window which opens, use the white **x** icon to remove the playlist from the show content. To remove all playlists from a show, right-click on the show in the **Calendar**, and select **Remove All Content** from the pop-up menu.



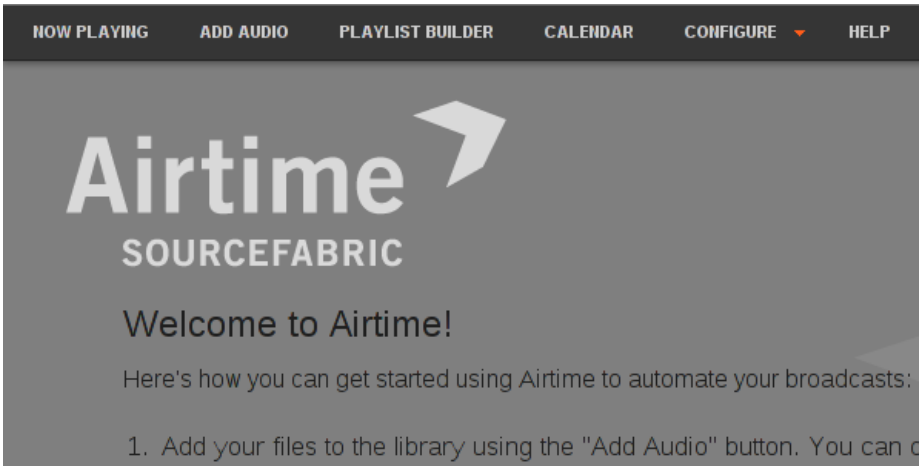
Deleting a show

To delete one instance of a regular show, right-click on the show in the **Calendar**, and select **Delete this instance** from the pop-up menu. If you wish to delete all future instances of this particular show, select **Delete this instance and all following** from the pop-up menu.

You cannot delete or remove content from shows that have already played out. These shows have only one option on the pop-up menu, which is **Show content**.

Help

The Help menu in Airtime offers a 'quick start' guide for new users.



You can visit the Airtime online support forum, and sign up for the mailing list, at http://forum.sourcefabric.org/index.php/f/14/

This forum is mirrored by the mailing list, so posts on the forum appear on the mailing list and vice versa. You can therefore also post a message there by emailing airtime-support@lists.sourcefabric.org

To subscribe to forum updates via mail, please register or login to the forum by clicking the appropriate link. Then click the 'Subscribe' button at the top of each forum page.

Bug reporting

Airtime needs your input to improve. If you think you've found a bug, please visit http://dev.sourcefabric.org/ and sign in, using the same login and password that you registered for the Airtime forum. Create a bug report by selecting **Create Issue**, then **Airtime**, and then **Bug**. That way, the Airtime team can keep track of your problem and notify you when it has been fixed. You can also suggest improvements and new features for Airtime on that site.

Contact

Finally, when all other avenues have been exhausted, email us directly at contact@sourcefabric.org and we'll try to help!

Other help

The UNESCO wiki *Community Radio - A user's guide to the technology*: http://cr-userguide.web4all.in/ features a very comprehensive guide to setting up a community radio station. This guide is aimed at people thinking about setting up a radio station in India, but includes lots of practical advice that would be useful in any country.

APPENDIX

Time zones

Use the appropriate time zone value from the list below in the *php.ini* file on your Airtime server.

Africa

```
Africa/Abidjan
Africa/Accra
Africa/Addis_Ababa
Africa/Algiers
Africa/Asmara
Africa/Asmera
Africa/Bamako
Africa/Bangui
Africa/Banjul
Africa/Bissau
Africa/Blantyre
Africa/Brazzaville
Africa/Bujumbura
Africa/Cairo
Africa/Casablanca
Africa/Ceuta
Africa/Conakry
Africa/Dakar
Africa/Dar_es_Salaam
Africa/Djibouti
Africa/Douala
Africa/El_Aaiun
Africa/Freetown
Africa/Gaborone
Africa/Harare
Africa/Johannesburg
Africa/Kampala
Africa/Khartoum
Africa/Kigali
Africa/Kinshasa
Africa/Lagos
Africa/Libreville
Africa/Lome
Africa/Luanda
Africa/Lubumbashi
Africa/Lusaka
Africa/Malabo
Africa/Maputo
Africa/Maseru
Africa/Mbabane
Africa/Mogadishu
Africa/Monrovia
Africa/Nairobi
Africa/Ndjamena
Africa/Niamey
Africa/Nouakchott
Africa/Ouagadougou
Africa/Porto-Novo
Africa/Sao_Tome
Africa/Timbuktu
Africa/Tripoli
Africa/Tunis
Africa/Windhoek
```

America

America/Adak
America/Anchorage
America/Anguilla
America/Antigua
America/Araguaina
America/Argentina/Buenos_Aires
America/Argentina/Catamarca
America/Argentina/ComodRivadavia
America/Argentina/Cordoba
America/Argentina/Jujuy
America/Argentina/La_Rioja
America/Argentina/Mendoza
America/Argentina/Rio_Gallegos
America/Argentina/Salta
America/Argentina/San_Juan
America/Argentina/San_Luis
America/Argentina/Tucuman
America/Argentina/Ushuaia
America/Aruba
America/Asuncion
America/Atikokan
America/Atka
America/Bahia
America/Bahia_Banderas
America/Barbados
America/Belem
America/Belize
America/Blanc-Sablon
America/Boa_Vista
America/Bogota
America/Boise
America/Buenos_Aires
America/Cambridge_Bay
America/Campo_Grande
America/Cancun
America/Caracas
America/Catamarca
America/Cayenne
America/Cayman
America/Chicago
America/Chihuahua
America/Coral_Harbour
America/Cordoba
America/Costa_Rica
America/Cuiaba
America/Curacao
America/Danmarkshavn
America/Dawson
America/Dawson_Creek
America/Denver
America/Detroit
America/Dominica
America/Edmonton
America/Eirunepe
America/El_Salvador
America/Ensenada
America/Fort_Wayne
America/Fortaleza
America/Glace_Bay
America/Godthab
America/Goose_Bay
America/Grand_Turk
America/Grenada
America/Guadeloupe
America/Guatemala
America/Guayaquil
America/Guyana
America/Halifax
America/Havana
America/Hermosillo

America/Indiana/Indianapolis
America/Indiana/Knox
America/Indiana/Marengo
America/Indiana/Petersburg
America/Indiana/Tell_City
America/Indiana/Vevay
America/Indiana/Vincennes
America/Indiana/Winamac
America/Indianapolis
America/Inuvik
America/Iqaluit
America/Jamaica
America/Jujuy
America/Juneau
America/Kentucky/Louisville
America/Kentucky/Monticello
America/Knox_IN
America/La_Paz
America/Lima
America/Los_Angeles
America/Louisville
America/Maceio
America/Managua
America/Manaus
America/Marigot
America/Martinique
America/Matamoros
America/Mazatlan
America/Mendoza
America/Menominee
America/Merida
America/Mexico_City
America/Miquelon
America/Moncton
America/Monterrey
America/Montevideo
America/Montreal
America/Montserrat
America/Nassau
America/New_York
America/Nipigon
America/Nome
America/Noronha
America/North_Dakota/Beulah
America/North_Dakota/Center
America/North_Dakota/New_Salem
America/Ojinaga
America/Panama
America/Pangnirtung
America/Paramaribo
America/Phoenix
America/Port-au-Prince
America/Port_of_Spain
America/Porto_Acre
America/Porto_Velho
America/Puerto_Rico
America/Rainy_River
America/Rankin_Inlet
America/Recife
America/Regina
America/Resolute
America/Rio_Branco
America/Rosario
America/Santa_Isabel
America/Santarem
America/Santiago
America/Santo_Domingo
America/Sao_Paulo
America/Scoresbysund
America/Shiprock
America/St_Barthelemy
America/St_Johns

America/St_Kitts
America/St_Lucia
America/St_Thomas
America/St_Vincent
America/Swift_Current
America/Tegucigalpa
America/Thule
America/Thunder_Bay
America/Tijuana
America/Toronto
America/Tortola
America/Vancouver
America/Virgin
America/Whitehorse
America/Winnipeg
America/Yakutat
America/Yellowknife

Antarctica

Antarctica/Casey
Antarctica/Davis
Antarctica/DumontDUrville
Antarctica/Macquarie
Antarctica/Mawson
Antarctica/McMurdo
Antarctica/Palmer
Antarctica/Rothera
Antarctica/South_Pole
Antarctica/Syowa
Antarctica/Vostok

Arctic

Arctic/Longyearbyen

Asia

Asia/Aden
Asia/Almaty
Asia/Amman
Asia/Anadyr
Asia/Aqtau
Asia/Aqtobe
Asia/Ashgabat
Asia/Ashkhabad
Asia/Baghdad
Asia/Bahrain
Asia/Baku
Asia/Bangkok
Asia/Beirut
Asia/Bishkek
Asia/Brunei
Asia/Calcutta
Asia/Choibalsan
Asia/Chongqing
Asia/Chungking
Asia/Colombo
Asia/Dacca
Asia/Damascus
Asia/Dhaka
Asia/Dili
Asia/Dubai
Asia/Dushanbe
Asia/Gaza
Asia/Harbin
Asia/Ho_Chi_Minh
Asia/Hong_Kong
Asia/Hovd
Asia/Irkutsk
Asia/Istanbul
Asia/Jakarta
Asia/Jayapura
Asia/Jerusalem
Asia/Kabul
Asia/Kamchatka
Asia/Karachi
Asia/Kashgar
Asia/Kathmandu
Asia/Katmandu
Asia/Kolkata
Asia/Krasnoyarsk
Asia/Kuala_Lumpur
Asia/Kuching
Asia/Kuwait
Asia/Macao
Asia/Macau
Asia/Magadan
Asia/Makassar
Asia/Manila
Asia/Muscat
Asia/Nicosia
Asia/Novokuznetsk
Asia/Novosibirsk
Asia/Omsk
Asia/Oral
Asia/Phnom_Penh
Asia/Pontianak
Asia/Pyongyang
Asia/Qatar
Asia/Qyzylorda
Asia/Rangoon
Asia/Riyadh
Asia/Saigon
Asia/Sakhalin
Asia/Samarkand
Asia/Seoul
Asia/Shanghai

Asia/Singapore
Asia/Taipei
Asia/Tashkent
Asia/Tbilisi
Asia/Tehran
Asia/Tel_Aviv
Asia/Thimbu
Asia/Thimphu
Asia/Tokyo
Asia/Ujung_Pandang
Asia/Ulaanbaatar
Asia/Ulan_Bator
Asia/Urumqi
Asia/Vientiane
Asia/Vladivostok
Asia/Yakutsk
Asia/Yekaterinburg
Asia/Yerevan

Atlantic Ocean

Atlantic/Azores
Atlantic/Bermuda
Atlantic/Canary
Atlantic/Cape_Verde
Atlantic/Faeroe
Atlantic/Faroe
Atlantic/Jan_Mayen
Atlantic/Madeira
Atlantic/Reykjavik
Atlantic/South_Georgia
Atlantic/St_Helena
Atlantic/Stanley

Europe

Europe/Amsterdam
Europe/Andorra
Europe/Athens
Europe/Belfast
Europe/Belgrade
Europe/Berlin
Europe/Bratislava
Europe/Brussels
Europe/Bucharest
Europe/Budapest
Europe/Chisinau
Europe/Copenhagen
Europe/Dublin
Europe/Gibraltar
Europe/Guernsey
Europe/Helsinki
Europe/Isle_of_Man
Europe/Istanbul
Europe/Jersey
Europe/Kaliningrad
Europe/Kiev
Europe/Lisbon
Europe/Ljubljana
Europe/London
Europe/Luxembourg
Europe/Madrid
Europe/Malta
Europe/Mariehamn
Europe/Minsk
Europe/Monaco
Europe/Moscow
Europe/Nicosia
Europe/Oslo
Europe/Paris
Europe/Podgorica
Europe/Prague
Europe/Riga
Europe/Rome
Europe/Samara
Europe/San_Marino
Europe/Sarajevo
Europe/Simferopol
Europe/Skopje
Europe/Sofia
Europe/Stockholm
Europe/Tallinn
Europe/Tirane
Europe/Tiraspol
Europe/Uzhgorod
Europe/Vaduz
Europe/Vatican
Europe/Vienna
Europe/Vilnius
Europe/Volgograd
Europe/Warsaw
Europe/Zagreb
Europe/Zaporozhye
Europe/Zurich

Indian Ocean

Indian/Antananarivo
Indian/Chagos
Indian/Christmas
Indian/Cocos
Indian/Comoro
Indian/Kerguelen
Indian/Mahe
Indian/Maldives
Indian/Mauritius
Indian/Mayotte
Indian/Reunion

Pacific Ocean

Pacific/Apia
Pacific/Auckland
Pacific/Chatham
Pacific/Chuuk
Pacific/Easter
Pacific/Efate
Pacific/Enderbury
Pacific/Fakaofo
Pacific/Fiji
Pacific/Funafuti
Pacific/Galapagos
Pacific/Gambier
Pacific/Guadalcanal
Pacific/Guam
Pacific/Honolulu
Pacific/Johnston
Pacific/Kiritimati
Pacific/Kosrae
Pacific/Kwajalein
Pacific/Majuro
Pacific/Marquesas
Pacific/Midway
Pacific/Nauru
Pacific/Niue
Pacific/Norfolk
Pacific/Noumea
Pacific/Pago_Pago
Pacific/Palau
Pacific/Pitcairn
Pacific/Pohnpei
Pacific/Ponape
Pacific/Port_Moresby
Pacific/Rarotonga
Pacific/Saipan
Pacific/Samoa
Pacific/Tahiti
Pacific/Tarawa
Pacific/Tongatapu
Pacific/Truk
Pacific/Wake
Pacific/Wallis
Pacific/Yap

About this manual

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Version 3, 29 June 2007

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Some devices are designed to deny users access to install or run modified versions of the software inside them, although the manufacturer can do so. This is fundamentally incompatible with the aim of protecting users' freedom to change the software. The systematic pattern of such abuse occurs in the area of products for individuals to use, which is precisely where it is most unacceptable. Therefore, we have designed this version of the GPL to prohibit the practice for those products. If such problems arise substantially in other domains, we stand ready to extend this provision to those domains in future versions of the GPL, as needed to protect the freedom of users.

Finally, every program is threatened constantly by software patents. States should not allow patents to restrict development and use of software on general-purpose computers, but in those that do, we wish to avoid the special danger that patents applied to a free program could make it effectively proprietary. To prevent this, the GPL assures that patents cannot be used to render the program non-free.

The precise terms and conditions for copying, distribution and modification follow.

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